4488.9
Am37
cop.3

This Issue Exceeds 98,000 Copies

# THE JOURNAL
OF THE
## American Medical Association

LIBRARY
RECEIVED
OCT 21 1938
U. S. Department of Agriculture

Subscription, $7.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 111, No. 17

COPYRIGHT, 1938, BY AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street, Chicago, Ill.

OCTOBER 22, 1938

## CONTENTS AND SUBJECT INDEX

Preventive Medicine: Its Outlook in Medical Education. W. S. Leathers, M.D., Nashville, Tenn. ..... 1517

Occupational Dermatoses: An Educational Program. C. Guy Lane, M.D., Boston ..... 1521

The Incidence of Occupational Dermatoses and Their Causes in the Basic Industries. Louis Schwartz, M.D., New York ..... 1523

Industrial Dermatitis: Definitions and Criteria for Diagnosis. Marion B. Sulzberger, M.D., New York, and Clark W. Finnerud, M.D., Chicago ..... 1528

The Practical Aspect of the Prevention of Industrial Dermatoses. Earl D. Osborne, M.D., and James W. Jordon, M.D., Buffalo ..... 1533

Analysis of Claims in Industrial Dermatoses. John Godwin Downing, M.D., Boston ..... 1536

The Compensation Laws and Related Medicolegal Considerations. H. R. Foerster, M.D., Milwaukee ..... 1542

Papers of Dr. Lane, Dr. Schwartz, Drs. Sulzberger and Finnerud, Drs. Osborne and Jordon, Dr. Downing and Dr. Foerster discussed by Drs. Dennie, White, Miller, Klauder, Rothman, Blaisdell, Parkhurst, Tauber, Maynard, Grindon, Taub, Lane, Schwartz, Finnerud, Osborne, Downing and Foerster.

Allergy in Childhood. W. Ambrose McGee, M.D., Richmond, Va. ..... 1551

Discussed by Drs. Pincus, Nicholson, Cohn and McGee.

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Artificial Concentration of Test Serums in Blood Grouping. Paul Hoxworth, M.D., and Earle Mahoney, M.D., Cincinnati ..... 1554

SPECIAL ARTICLE

Vitamin C: Pharmacology and Therapeutics. Arthur P. Abt, M.D., and Chester J. Farmer, A.M., Chicago ..... 1555

COUNCIL ON FOODS 1565

EDITORIALS

The American Pharmaceutic Industry Promotes Intensive Research. 1566

Deaths Following Elixir of Sulfanilamide-Massengill: VIII ..... 1567

Staphylococcic Food Poisoning. 1568

CURRENT COMMENT

Syphilis and Gonorrhea ..... 1569

Tobacco and Blood Pressure ..... 1569

Nutritional Problems ..... 1569

BUREAU OF LEGAL MEDICINE AND LEGISLATION

(Subject Index on next page)

ORGANIZATION SECTION

American Medical Association and Interdepartmental Committees to Confer on National Health Program ..... 1570

American Medical Association Study of Medical Care: Vanderburgh County, Indiana ..... 1570

Official Notes ..... 1573

Women's Auxiliary ..... 1577

A M A SESSION St. Louis May 1 [illegible]


# HERMAN'S Practice of Urology

The British Medical Journal says that Dr. Herman's Practice of Urology *"is written from clinical experience and packed with valuable hints and tips. The legends accompanying the numerous and excellently produced illustrations are a urological education in themselves. Altogether this is one of the best books on urology one could wish for."*

This opinion is indicative of the enthusiastic manner in which this *new* book is being received. The General Practitioner is finding it especially helpful, because Dr. Herman wrote his book only after a very careful consideration of the problems frequently encountered in everyday practice.

This is a work on the *medical treatment* of urologic diseases. Kidney ailments, bladder disorders, prostatism, gonorrhea, and many other diseases and conditions that present themselves to the Family Physician for diagnosis and treatment are discussed. You will find the *new* and standard tests, methods of physical examination, urography, cystoscopy, urinalysis, etc. Systemic measures, dietetic treatment, diuretic therapy, the use of drugs, solutions and antiseptics and surgical indications are given throughout the book.

To quote Northwest Medicine: *"This is one of the most concise and complete texts on urology that we have ever had the privilege of reading."*

By Leon Herman, B.S., M.D., Professor of Urology, University of Pennsylvania, Graduate School of Medicine. Octavo of 933 pages with 705 illustrations on 504 figures. Cloth, $10.00 net.

See Also SAUNDERS ADVERTISEMENT—Page 3

## SUBJECT INDEX TO THIS ISSUE

The letters used to explain to which department the matter indexed belongs are as follows: The Star (*) indicates an Original Article; "Ab." abstract; "E." Editorial; "C." Correspondence; "M." Medicolegal; "MR." Medical Research; "OS." Organization Section; "SS." Student Section.


A. M. A., and Interdepartmental Committee to confer on National Health Program ..... OS-1570
study of medical care, Vanderburgh County, Ind. ..... OS-1570
Acid, nicotinic, for vitamin $B_2$ stomatitis ..... ab-1602
test meal, value ..... ab-1597
Addison's Disease, desoxycorticosterone acetate in ..... ab-1602
vitamin C in ..... *1562
Alcoholism, anemia in ..... ab-1593
Allergy in childhood ..... *1551
Clinics, Association of, New York ..... 1575
Amputation, fantom limb pain ..... ab-1595
Androgens and cunuchoidism ..... ab-1595
Anemia and vitamin C ..... *1559
aplastic, bone marrow histology in ..... ab-1595
"hematopoietic principle" in diseased human liver ..... ab-1593
of alcohol addicts ..... ab-1593
"scarlet fever heart" and ..... ab-1604
Anesthesia, effect on vitamin C excretion ..... *1558
helium in ..... ab-1601
Arthritis or Köhler's disease ..... 1585
Asthma, posterior pulmonary plexus resection in ..... ab-1595
Aviation, preparation for casualties of air raids ..... 1577
Best, Charles H., to address Institute of Medicine ..... 1573
Bidens, hay fever from pollens ..... 1585
Bile, dried, in gastrointestinal disorders ..... ab-1598
Blood after sulfanilamide compound ..... ab-1602
"hematopoietic principle" in diseased human liver ..... ab-1593
grouping, concentration by lyophile method ..... *1554
pressure, effect of smoking ..... E-1569
pressure, effect of vitamin C ..... *1558
"restropic" activity ..... ab-1601
vitamin C in ..... *1556; ab-1602
Blood, fetal ..... 1889
Bone Marrow in aplastic anemia ..... ab-1595
Book Notices ..... 1888
Book, Recommended ..... Adv. page 88
Brain tumors, early diagnosis ..... ab-1600
Breast Feeding, Orthopedic aspects ..... ab-1604
Bureau of Legal Medicine and Legislation ..... 1891
Burns from formaldehyde disinfection of shoes ..... 1586
Cancer, biochemical problem ..... 1578
Ellis Fischel Cancer Hospital for Indigents ..... 1574
New York City Committee annual dinner ..... 1575
research ..... 1581
treatment centers, Georgia ..... 1573
treatment, survey of types ..... 1576
Capillary action of vitamin C ..... *1558
Cerebrospinal Fluid, falsely positive Wassermann ..... ab-1600
vitamin C in ..... ab-1602
Children's Bonheure House, fund being raised for ..... 1575
Chlorinated drinking preparation dangers ..... 1585
Colds, cause in oil for ..... ab-1599
Correspondence ..... 1888
Correspondence on Foods ..... 1888
Crippled Children, services for, N. C. ..... 1575
Crossen, O., death ..... 1574
Darwin family ..... 1577
Deafness, campaign against, Calif. ..... 1573
Deaths ..... 1888
Dermatitis herpetiformis, etiology ..... ab-1601
Desoxycorticosterone acetate in Addison's disease ..... ab-1602
Dextrose tolerance test ..... 1586
Diet Therapy in surgical urology ..... ab-1598
Diagnosis, drugs useful for ..... C-1583
Dictionary, chemicals, dangers from ..... 1585
Diet, dietary, in convalescence ..... ab-1595
dietary, time calculation ..... 1574
Diuretic effect of vitamin C ..... *1557
Dysentery, Sonne, in 2 year old ..... 1584
Encephalitis, streptococcic, prenatal cure ..... 1578
Encephalitis, epidemic, benzedrine in parkinsonism ..... ab-1604
Endocrine disorders and vitamin C ..... *1562
Erysipelas, sulfanilamide treatment ..... ab-1601
Eserine, Prostigmin and analogues ..... ab-1595
Extremities, fantom limb pain ..... ab-1595
Eyes, vitamin C and ..... *1561
Face, varicosities ..... 1586
Feces, vitamin C in ..... *1557
Food allergy in childhood ..... *1551
poisoning from tainted pastry, Chicago ..... 1573
poisoning, staphylococcic ..... E-1568
Foreign Letters ..... 1877
Formaldehyde disinfection of shoes ..... 1586
Gastrointestinal Tract diseases and vitamin C ..... *1563
disorders, dried bile in ..... ab-1598
Gonadotropic Substances, dosage ..... 1584
Gonococcus, degeneration; variation ..... ab-1596
Gonorrhea, incidence in U. S. ..... E-1569
sulfanilamide in ..... 1579
Government Services ..... 1879
Hay fever from "composite" pollens ..... 1585
Health education, Negro Institute for, Pa. ..... 1575
Hall of Health, Atlanta ..... 1573
National Health Program, A. M. A. and interdepartmental committees to confer ..... OS-1570
public, changing attitudes toward ..... *1517
U. S. Public Health Service changes ..... 1576
Heart insufficiency in death from histamine ..... ab-1606
scarlet fever ..... ab-1604; ab-1605
Helium in sacculus rhombi ..... ab-1601
Hemorrhage, relation to vitamin C ..... *1560
Histamine, deaths from ..... ab-1606
Hunting season, hazards of ..... 1576
Immunity and vitamin C ..... *1563
Industrial Accidents, symposium on ..... *1521; *1523; *1528; *1533; *1536; *1542 (discussion) ..... 1547
health, committee on, Connecticut ..... 1573
Infant, smallest, to survive ..... C-1583
Infections, possible role of vitamin C in ..... *1561
Insurance, national, Australia ..... 1580
Intestines volvulus and trauma ..... 1585
Iritis from scissors ..... 1586
Jaundice, immunization against Weil's disease ..... ab-1606
Köhler's Disease or arthritis in adult ..... ab-1585
Lamblia, pathogenic importance ..... ab-1603
Leukemia and vitamin C ..... *1560
Licensure, Iowa requires citizenship of foreign graduates ..... 1573
Lips, varicosities ..... 1586
Liver, diseased, "hematopoietic principle" in ..... ab-1593
rose bengal function test, compound for ..... C-1581
Lochiometra, quinine calcium for ..... ab-1605
Lyophile method, concentration of test serums by ..... *1554
Marriages ..... 1891
Massengill, S. E., trial ..... E-1567
Mastoiditis: trauma in relation to ..... MI-1591
Mayo Foundation House dedicated ..... 1574
Medical Education in Australia ..... 1580
graduate clinics, New Orleans ..... 1574
graduate course on specialties, Mich. ..... 1574
graduate meeting, fed. ..... 1573
preventive medicine ..... *1517
Medicine, Osteopathic and Licensure ..... 1887
Medical Jurisprudence aspects of industrial dermatosis ..... *1542
Medical Practice Acts: chiropractic: physical therapy in relation to ..... MI-1592
Medical Service to be discussed in newspaper forum ..... 1576
Vanderburgh County, Indiana ..... OS-1570
Meetings, Annual Abstracts ..... 1891
Meetings, Coming Elsewhere ..... 1882
Meningitis, sulfanilamide for ..... 1578
Menstruation and ovarian hormone disorders ..... ab-1603
Military Medicine, International Congress ..... 1576
Monococcus, crusade against, Italy ..... 1579
Myoma, roentgen therapy ..... 1579
Negro Institute for Health Education, Pa. ..... 1575
Nephritis, glomerulonephritis, serum antistreptolysin in ..... ab-1597
Neurosyphilis, acquired or congenital, intravenous aldarsone in ..... ab-1594
News ..... 1875
Nomenclature, International Commission for Dextrose, Report ..... 1576
Nutrition of Australian people ..... 1576
international problems ..... E-1569
Organization Section ..... 1870
Ovary hormone disorders, uterine hemorrhage from ..... ab-1603
Ozone in oil treatment of acute colds ..... ab-1599
Pancreatitis, chronic, trophic changes of skin in ..... ab-1605
Pemphigus, etiology ..... ab-1601
Peptic Ulcer, sleep-sedation for ..... ab-1606
complications after gastric resection ..... ab-1605
vitamin C and ..... ab-1602
vitamin C plus histidine for ..... ab-1603
Pharmaceutic industry promotes intensive research ..... E-1566
Physicians, Medicine, Academy of ..... 1576
Pneumococcus and sulfanilamide ..... ab-1593; ab-1602
Pneumonia and sulfanilamide ..... ab-1593
Pregnancy diagnosis, Kustalow's test ..... ab-1604
Preventive Medicine: outlook in medical education ..... *1517
Prostigmin in experimental tuberculosis ..... ab-1595
in streptococcic empyema ..... 1577
Psychosis, constitutional personality ..... 1584
Pulmonary Plexus (posterior) resection in asthma ..... ab-1595
Quorin and Minor Notes ..... 1883
Rabies committee appointed, Mich. ..... 1574
Radio Broadcasts ..... 1872
Radio, medical care to be discussed in newspaper forum ..... 1576
Reticulo-Endothelial System, "restropic" activity of blood ..... ab-1601
Rickets, renal osseous in baby ..... 1578
vitamin $D_2$ and $D_3$ concentrates in ..... ab-1605
Ringworm, formaldehyde disinfection of shoes ..... 1586
Roentgen Rays, German Society ..... 1579
Sandfly Fever, virus ..... ab-1602
Scarlet Fever control ..... ab-1593
heart ..... ab-1604; ab-1605
Scissors, iritis from ..... 1586
Scurvy, relation of vitamin C to ..... *1558
Serum antistreptolysin in glomerulonephritis ..... ab-1597
Shoes, formaldehyde disinfection ..... 1586
Skin disease, industrial, symposium on ..... *1521; *1523; *1528; *1533; *1536; *1542 (discussion) ..... 1547
pigmentation and vitamin C ..... *1562
trophic changes in chronic pancreatitis ..... ab-1605
Social Hygiene Clinic, new quarters, Chicago ..... 1573
Society Proceedings ..... 1892
Solvesol Concentrate, dangers from ..... 1585
Splint, Thomas, modification ..... 1577
Staphylococcus food poisoning ..... E-1568
State Board Examinations ..... 1887
Stomach cancer, alcohol-sedation for ..... ab-1606
value of acid test meal ..... ab-1597
Stomatitis, vitamin $B_2$, nicotinic acid for ..... ab-1602
Sulfanilamide and pneumococcic infections ..... ab-1593
compound, blood after ..... ab-1602
Elixir of Sulfanilamide-Massengill ..... E-1567
treatment of erysipelas ..... ab-1601
treatment of gonorrhea ..... 1579
treatment of meningitis with septicemia ..... 1578
Syphilis, acquired juvenile ..... ab-1594
incidence in U. S. ..... E-1569
premarital tests required for eight states ..... 1576
Teeth, relation of vitamin C to ..... *1561
Teeth, undescended, danger of gonad stimulating hormones ..... 1584
Tetanus prophylaxis, failure ..... ab-1606
Tobacco, effect of on blood pressure ..... E-1569
Toxins and Antitoxins ..... Adv. page 28
Trauma and volvulus ..... 1585
Tuberculosis, experimental, prostasil in ..... ab-1595
pulmonary, artificial pneumothorax in, results ..... ab-1594
pulmonary, artificial pneumothorax reliefs in Europe ..... 1586
Typhoid in resort hotels, New York ..... 1575
Undulant Fever, chronic, treatment ..... 1586
Urine, vitamin C in ..... *1557
Urology, surgical, diabetes in ..... ab-1598
Uterus hemorrhage from hormone disturbances of ovary ..... ab-1603
Varicose Veins of lips and face ..... 1586
ulcers (postphlebitic) surgical technic ..... ab-1599
Vitamin B, stomatitis, nicotinic acid for ..... ab-1602
C and peptic ulcer ..... ab-1602
C, chemistry; therapeutics ..... *1555
C, its blockade in peptic ulcer ..... ab-1603
C requirements in man ..... ab-1597
$D_2$ and $D_3$ concentrates in rickets ..... ab-1605
Wassermann Test, falsely positive of spinal fluid ..... ab-1600
Whedbee, Amos S., honored ..... 1574
Women's Auxiliary ..... 1872
Workmen's Compensation Acts: vision, loss of; losses in relation to ..... MI-1592
industrial dermatoses ..... *1536; *1542
leukopenia; paralysis in relation to MI-1591
lumping fluid; septicemia from ..... MI-1591
Wound healing, role of vitamin C in ..... *1564


THE JOURNAL of the American Medical Association is published weekly by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. Subscription price, $7.00 a year, 25c a copy. Canadian $8.50, Foreign $10.00. Entered as second class matter June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879.

CRESCENT
RIGIPOISED
MIKRO-KEEN.
and costs LESS!
WRITE FOR FREE SAMPLE
Crescent Surgical Sales Co., Inc.
440 FOURTH AVENUE NEW YORK, N. Y.

# The Journal of the American Medical Association

**Published Under the Auspices of the Board of Trustees**

VOL. 111, No. 17 — CHICAGO, ILLINOIS — OCTOBER 22, 1938


COPYRIGHT, 1938, BY AMERICAN MEDICAL ASSOCIATION

## PREVENTIVE MEDICINE

### ITS OUTLOOK IN MEDICAL EDUCATION

W. S. LEATHERS, M.D.

NASHVILLE, TENN.

Our ideas concerning the prevention and control of disease have undergone remarkable transformation during the past century and especially during the past fifty years. Many of the great conquests in medicine have been achieved in the field of preventive medicine and public health. One who reads the biographies of Walter Reed, Pasteur, Trudeau or "An American Doctor's Odyssey" by Heiser is impressed with the romance and spirit of adventure which one may experience in the prevention and control of disease and in the field of medical research. The progress that has been made in this phase of medical service constitutes a record of those principles the scientific application of which should ultimately result in "man's redemption of man."

### CHANGING ATTITUDES TOWARD PUBLIC HEALTH

Before the era of the science of bacteriology and immunology the practice of preventive medicine was focused on the environment. The methods employed were based largely on empiricism. Our concept of preventive medicine at that time was completely dominated by the filth theory of disease. Public health procedures, as a consequence, were directed chiefly toward the abatement of nuisances, the removal of refuse, isolation and quarantine of the sick, and disinfection. This attitude toward public health prevailed largely until the epoch-making researches of Pasteur, Koch, Lister, Loeffler, Behring, Ehrlich, Laveran, Manson and Walter Reed, whose discoveries established the etiologic and immunologic factors involved in the use of scientific methods in the diagnosis, treatment and control of the infectious diseases. The emphasis that had been placed on the environmental theory of disease during the nineteenth century began to be discarded in favor of the germ theory at the beginning of the twentieth century. There was, therefore, a change in emphasis from the environmental factors of disease to the health of the individual himself and to his relation to the family and to the community. Thus our horizon was rapidly extended to include a study of maternal, infant and preschool care, the health of the school child, the effect of physical changes of adolescence on health, and the health problems of the adult and of the family as the most stable unit of society. Periodic medical examination and general health supervision of the community likewise became of paramount importance in the public health program.

The "trial and error" method was gradually discontinued and the newer knowledge of preventive medicine was applied in a common sense, orderly and technical way. There have been organized, as a result, during the past twenty-five years an increased number of full time county or district health departments. These are usually directed by physicians whose professional education and experience are such as to command the respect and confidence of the medical profession and of the public. Experiments prove and experiences show that the methods of preventive medicine today may be considered as dependable as those of other branches of medicine. In reality, preventive medicine constitutes a part of clinical medicine, obstetrics, pediatrics and psychiatry, and even much of surgery. Its purpose is to avert those disorders for which there are specific preventive measures; to detect early by accurate and thorough methods of diagnosis the beginnings of illness for which remedial therapy may be effectively applied. Its objective is to aid in the solution of social, economic and welfare problems of the community in relation to disease. It involves the use of a special technic in dealing with the public. The application of the principles of preventive medicine through organized administrative procedure in relation to local, state and national needs constitutes public health. Obviously, preventive medicine and public health are complementary and interdependent. Each is indispensable to community welfare.

### PROGRESS IN EUROPE

The question may be asked What is the present status of preventive medicine in medical education? In 1924, through the generosity of the Rockefeller Foundation, it was possible for me to devote a year in a study of medical education and public health activities in foreign countries. These were France, England, Scotland, Switzerland, Belgium, Germany, the Netherlands, Denmark and Norway. This investigation was undertaken with particular reference to the place of preventive medicine and public health in the scheme of medical education. It was a task of trying to determine what factors must be considered to provide adequate instruction in this subject, particularly for undergraduate medical students. Much time was devoted also to a study of public health administration and the facilities afforded for the professional education of public health personnel. In 1932 it was possible for me to return to Europe as a member of the Board of Scientific Directors of the International Health Division of the Rocke-

From the Department of Preventive Medicine and Public Health, Vanderbilt University School of Medicine.

Read before the Medical Section of the Inauguration Program of President Rufus Carrollton Harris, Tulane University, New Orleans, Jan. 17, 1938.

feller Foundation. This afforded an opportunity to extend these observations in other countries, namely Spain, Italy, Yugoslavia, Bulgaria, Austria, Poland and Hungary.

Significant progress had been made in many of these countries in the development and extension of organized public health work, largely as a result of the interest and grants-in-aid of the International Health Division of the Rockefeller Foundation.

The problems of medical education were of much interest, particularly in relation to the systems of medical service which had been developed in the older countries and which have been founded more largely on principles of state control than has been done in our own country. It was possible also to study the public health organizations and the methods that were employed in the protection of individual and community health. The interchange of points of view with public health authorities and teachers in medical faculties and official groups was helpful in forming a perspective with reference to the relationships which should be maintained in medical schools between the clinical branches of the curriculum and instruction in preventive medicine, and also the relationships which should exist between public health activities and the practice of medicine.

Time will not permit a more detailed consideration of this matter. It is sufficient to state that there was obvious need for more adequate instruction of medical students in hygiene and preventive medicine in the countries visited. The instruction in this phase of medical education was chiefly of a didatic nature. The courses consisted of from ten to seventy lectures, usually in the fifth curricular year and sometimes also in the sixth. Some attention was given to laboratory exercises with particular reference to water supplies, sewage products and food adulteration. Microbiology was included in the third year curriculum in a few medical schools. The lecturers or professors were frequently members of the local health service and therefore devoted a relatively small part of their time to teaching students. The teaching facilities in preventive medicine and public health were chiefly centered in institutions of hygiene and schools of public health in which there was a predominant interest in bacteriology and immunology, including clinical aspects of the infectious diseases. But little attention was given to administrative procedures in public health in relation to the practitioner of medicine and the technical phases of personal and community hygiene. There was, however, a marked interest in providing more adequate facilities for the teaching of undergraduate medical students.

Since 1932 more consideration has been given in these countries to the instruction of undergraduate medical students. This is particularly true of Cluj, in which a course of instruction for medical students is provided along modern lines, including reasonable opportunity for laboratory exercises and field demonstrations. The course consists of "instruction in the prevention of infectious diseases, disinfection, personal hygiene, housing, nutrition, water supplies, sewage disposal, child hygiene, industrial hygiene and vital statistics. The students are required to present before examination a sanitary survey of some village." The plan of instruction for medical students is also especially noteworthy and well developed in Nancy under the able direction of Professor Parisot. The teaching staff of the Institute of Hygiene has a full time personnel which expresses consistent interest and constructive outlook in the plan of instruction of undergraduate medical students. Progress has been made also in Hungary, Poland, Czechoslovakia and Yugoslavia in this phase of instruction. There is a forward look in countries visited with reference to providing better facilities and more adequate instruction in hygiene and preventive medicine to undergraduate medical students. The training of the physicians in hygiene and public health should not be deferred as an interest in postgraduate instruction, which unfortunately has been done largely in many countries in developing public health organizations.

### SITUATION IN THE UNITED STATES AND CANADA

Early in 1925 a few months were devoted to observations in the medical schools of some of the leading universities in the United States and Canada, notably, Harvard, Yale and the University of Toronto. The situation was obviously encouraging. Provision had been made for the teaching of preventive medicine and public health to medical students. The medical school in each of these universities had a reasonably well organized department provided with a budget and full time personnel for teaching and research. In Toronto the fifth year medical students devoted three weeks to field work in public health, one half of the class taking the work at the end of the session and the other half just prior to the beginning of the session of the sixth year. In Harvard, each medical student was required to make a careful sanitary survey before graduation in medicine as a part of the regular course in hygiene and preventive medicine. At Yale provision was made for a number of field demonstrations and special studies of public health activities in the municipal and state health organization. In these medical schools a serious effort was made to give the students some knowledge of personal and community hygiene and the application of preventive measures by official health agencies and their significance in relation to medical practice.

The outlook for preventive medicine in medical education in the United States is encouraging. However, if one is to realize fully the benefits that may be derived from the available knowledge for the control of disease and the promotion of individual and community health it is necessary that authorities in medical schools give intelligent and aggressive direction in effecting more adequate arrangements and facilities for instruction of students in this phase of medical service. No plan or system is offered for realizing this objective in medical education. The solution of the problem depends obviously on an analysis of the conditions confronting the medical faculty of each university. There can be, however, no question as to the need and the advisability of affording better facilities for this type of instruction in our medical schools.

In 1926 there were nine medical schools in the United States and three in Canada that had full time departments of preventive medicine. In each of these institutions a budget was provided and full time personnel was engaged in the instruction of undergraduate medical students. Today, with the criterion of the full time department as a basis for comparison, there are now approximately eighteen full time departments in medical schools in the United States and seven in Canada. This shows an increase in our own country of 100 per cent during the past decade and in Canada of slightly more

than 100 per cent. A few of the departments that existed in 1926 have enlarged their facilities for teaching and research. Much more emphasis is being placed also on the practical aspects of instruction such as assignments for field experience, field demonstrations, epidemiologic exercises, laboratory methods for the diagnosis of communicable diseases and environmental case studies. Special studies also are being made of public health problems in the community and state health organizations; seminars are being used as a means of developing the interpretative power of the student in statistical analysis and epidemiologic observations.

### INSTRUCTION

Although the didactic or lecture method should be used, within limitations, in teaching preventive medicine and public health to the medical student, practical or clinical measures must be employed to gain and maintain the interest and stimulate the imagination of the student. The plan of teaching should give the student an experience reasonably comparable to that which is afforded by the "clinical clerkship" in medicine. For example, the environmental case study is a phase of instruction which is now used in Yale, Vanderbilt, Syracuse, Johns Hopkins and possibly other universities. This directs the interest of the student especially to the individual rather than to a group of the population. A particular clinical and public health problem is undertaken in the study of the patient in relation to his family, his home, his occupation, his social-economic status and to the official and unofficial health and welfare agencies whose aid may be invoked in the solution of the treatment involved. These cases are selected cooperatively by the clinical and public health departments and the social service division of the hospital. A report is finally made by the student to the class, and representatives of the agencies concerned are invited to attend. This method of teaching affords an unusual opportunity for the student to obtain some idea of the background of disease, its significance in the economy of life and the factors that should be considered in attaining the best results in the treatment of both the patient and the disease. The students display much interest in this type of teaching. Their imagination is stimulated by a clearer understanding of the social, religious, psychologic and economic factors involved in the effective use of therapeutic and preventive measures in the control of disease.

There is need to implement the practical aspects of instruction of medical students in preventive medicine and public health. The use of procedures which will integrate this instruction with other subjects in the medical curriculum is of the greatest value. A unified purpose should be created and maintained in the faculty for teaching the principles involved in personal and community health. The student must be aroused to have the long range view in the prevention and cure of disease. This objective cannot be successfully accomplished without a full time department of preventive medicine and public health which functions not only in giving necessary formal instruction to the students but which will also relate its work to the personnel of other departments in the medical school. This serves to stimulate and maintain the interest and cooperation of members of the faculty in establishing a point of view in the medical student which will cause him later to practice preventive as well as curative medicine. In a word, unless the instruction in this field of medical service is organized so as to carry on a well ordered, effective and dynamic teaching and research program, the interest and imagination of the undergraduate medical student will not be secured and maintained comparable to that afforded by instruction in the fundamental sciences and the clinical branches of medicine. In schools where this is accomplished, gratifying results are obtained from the point of view both of training future practitioners in the preventive aspects of medicine and of causing a larger percentage of graduates to adopt public health as a career.

Preventive medicine and public health must be integrated in the scheme of medical education so that the 5,000 graduates of medicine who are turned out annually on a receptive public will be imbued with their responsibility to use in practice available knowledge for the prevention of disease and the protection of community health, for the physician in a sense should act the part of a deputy health officer. He should have an intelligent understanding of the activities of official and unofficial health agencies in his community and state. He should cooperate in promoting the work of the local health department. He should serve as an outpost in a field of preventive medicine. He should regard himself as an integral part of the national public health program.

If this goal is achieved a great and permanent contribution will be made in providing a more adequate medical service for the indigent and the low income groups of the population. There will also be a better understanding and, as a result, a closer cooperation between public health agencies, official and nonofficial, and the medical profession in the treatment and prevention of disease and, broadly speaking, in the general promotion of public health.

What motivating agencies are engaged to accomplish this result? From about 1920 the Association of American Medical Colleges and the Council on Medical Education and Hospitals of the American Medical Association have emphasized the great need for teaching preventive medicine and public health in the curriculum in the modern medical school. The records of the Association of American Medical Colleges show that provision was made in the constitution and by-laws published in 1907 in which thirty lectures were advised. However, in 1923, after a careful survey by a committee of this association, it was specified that from 3 to 4 per cent of the total number of hours (from 3,600 to 4,400) should be devoted to this type of instruction. This would mean approximately from 108 to 175 hours per year. In the *Proceedings of the Annual Congress on Medical Education and Licensure* of the American Medical Association a number of papers on this subject have been published during the past two decades concerning its place in the medical curriculum, and there appears to be an agreement between the two associations as to the minimum number of hours that should be included.

### INSPECTION OF MEDICAL SCHOOLS

During a period of two years prior to May 1936, all the medical schools in the United States and Canada were inspected under the general direction of the Council on Medical Education and Hospitals of the American Medical Association. These data have been used in an attempt to evaluate the departmental activities, certain criteria being used that may be applied on a comparable basis. The Secretary of the Council on Medical Education and Hospitals in making his annual

report to the House of Delegates of the American Medical Association at its meeting in Atlantic City on June 7, 1937, made the following significant statement:

> Preventive medicine, although of undoubted importance, has not yet developed a clearcut and generally accepted objective so far as the teaching of undergraduate medical students is concerned. In some instances a good deal of time is spent in demonstrating the activities of a state or city department of health; in others, students are required to make and report on a sanitary survey, while still others act on the assumption that for the man in practice the most important thing is that all of his daily contacts should be measured with a realization of the importance of prevention and that his attitude can be instilled only by clinical teachers who exemplify it in their own practice. A further study of this problem is an obvious need.[1]

The chief difficulty, as I understand the problem, is not a question of an ill defined objective but rather a lack of available funds and the barrier afforded too often by the conservatism of medical faculties in making necessary adjustments in the curriculum for systematic instruction in the preventive and public health aspects of medicine. There appears to be a tradition of temporizing and in some instances of assuming a laissez-faire attitude in making adequate provision for this type of instruction.

### WORK BEING DONE

Within recent years the Committee on Professional Education of the American Public Health Association, although organized primarily for the purpose of defining the professional educational qualifications of public health personnel, has also taken steps to stimulate interest in a more thorough preparation of the undergraduate medical student in the prevention and control of disease. A subcommittee has been appointed for this purpose and its chairman, Dr. W. G. Smillie,[2] on behalf of the committee, a few years ago enlisted the aid of Dr. Alan Gregg, director of the Division of Medical Sciences of the Rockefeller Foundation, in giving leadership in this undertaking. The first step was to provide opportunity for full time teachers of preventive medicine and public health to visit medical schools in which the instruction in this field was being done in a reasonably effective way. This afforded a basis for observation and interchange of experiences between members of medical faculties concerning this problem. Each person who was accorded this privilege was required to make a report embodying his observations and conclusions. Then a second step was taken, making it possible for several deans of medical schools to visit institutions in which there were full time departments of preventive medicine and public health. This proved stimulating and I hope constructive. The third step has been taken in securing the services of Dr. J. G. FitzGerald, professor of hygiene and preventive medicine in the Faculty of Medicine of the University of Toronto, and to assist him, Dr. C. E. Smith of Stanford University, to devote a year in a study of this problem in European countries and in the United States and Canada. This study was concluded in September 1937. Dr. FitzGerald will present his observations and conclusions at the annual meeting of the Council on Medical Education and Hospitals on February 14 in Chicago. A summary of this information will be available for those who may be interested.

The Commonwealth Fund [3] has provided during the past several years grants-in-aid for three medical schools —Vanderbilt, Tufts and Tulane—to enlarge their personnel and physical facilities for the instruction of medical students in the preventive and public health aspects of medicine. At Vanderbilt, a department of preventive medicine and public health was established on a full time basis when the medical school was reorganized in 1925. The curriculum is clearly oriented toward public health practice, although the teaching is effectively integrated with clinical instruction. At Tufts a strongly clinical slant has been developed in the instruction of the department, although some consideration is given to the public health aspects of this subject. At Tulane, although the broader aspects of public health are given consideration, the department of preventive medicine is essentially a clinical approach built round a rather broadly conceived periodic health examination plan of instruction. In all three departments the methods are somewhat different, but the objective has been maintained to secure, if possible, the interest of the student and to afford him opportunity to acquire information that may be used in the practice of his profession. The purpose of the fund was to introduce experimental procedures in determining effective methods which may be employed to improve the quality of instruction in preventive medicine and public health and to integrate more definitely the teaching with clinical branches of medicine.[4]

The outlook of public health in medical education and in practice was greatly facilitated by the passage of the Social Security Act by Congress in 1935. This act provides $10,000,000 a year for use by the United States Public Health Service, on a diminishing scale during a ten year period, for the expansion of state and local health services. The fund is distributed (1) on the basis of population, (2) because of special health problems and (3) according to the financial needs of the respective states. As much as $2,000,000 of this amount may be used for research. The money cannot be used to supplant existing appropriations of state and local health agencies but rather to stimulate additional appropriations and to provide for their most effective use. One of the purposes of the allocation of funds to the respective states is to provide competent personnel so as to raise the professional level of those who are to participate in the public health program. To meet this need a little more than $1,000,000 has been set aside to provide subventions for developing postgraduate instruction in five universities, which are strategically located and in which facilities can be readily made available for this purpose. Postgraduate courses in five universities, from three to four months in duration, have been developed to meet an emergency need. In addition, the two schools of hygiene and public health at Johns Hopkins and Harvard universities have special endowments and facilities for graduate instruction in preventive medicine and public health. A number of other universities provide advanced instruction in public health as a part of the curriculum of graduate schools. For all practical purposes in some of these universities the opportunity afforded may be considered adequate in giving higher degrees such as that of Doctor of Public Health.

1. Cutter, W. D.: Report of the Council on Medical Education and Hospitals: Proceedings of the Eighty-Eighth Annual Session of the American Medical Association, J. A. M. A. 108: 2134-2137 (June 19) 1937.
2. Smillie, W. G.: The Incorporation of the Principles of Preventive Medicine in Clinical Teaching, Proc. Ann. Conf. M. Educ., 1934, pp. 24-28.
3. Contributions to Professional Education, Annual Report of the Commonwealth Fund, 1936, pp. 18-24.
4. Annual Report of the Commonwealth Fund, 1936.

There are also being developed special health centers in New York City, domiciled in new buildings with improved facilities, five of which are located in districts in the environment of medical schools. These centers are to be used not only for the administration of public health in these areas but also for teaching undergraduate medical students and for training public health personnel. This opportunity is not limited to public health personnel employed by the city health department, but opportunity will be afforded for registration of those who may be engaged in public health work in other parts of the country. This is an advance step and one which gives increased recognition to the value of making adequate provision for teaching especially the medical student. Each of these medical schools will have a full time department of preventive medicine and public health and will be provided with adequate facilities for teaching in cooperation with the health centers.

There is a nationwide plan to provide full time, efficient public health service to every community in the United States. Obviously, the program that has been projected has created a great need for properly prepared physicians to engage in public health. It places a definite and immediate responsibility on the medical schools of this country to prepare their students in such a manner that a reasonable proportion of them will not only be attracted to public health as a career but be trained to integrate properly the preventive and clinical phases of medicine in special and general practice.

### RESPONSIBILITY OF MEDICAL PROFESSION

It is clear, therefore, that the boundaries of the medical horizon are being rapidly extended because of new knowledge that is available for the protection of individual and community health. Moreover, the responsibility of the medical profession has been increased greatly because of the demands of the thoughtful public for improvement in the diagnosis, treatment and prevention of disease. This concept has been well expressed by Dr. Gregg [5] in an address which he delivered during the Tercentenary Celebration of Harvard University Sept. 15, 1936, in which he stated:

> The earliest intimation of the ultimate boundaries of medicine are beautifully outlined in the words of Christ, "I am come that they might have life and have it more abundantly." From the study of human genetics, and of nutrition, from the study of the human being as an indivisible unity, from grave consciousness of our obligations to society, and no doubt from unforeseen quarters will come knowledge that may make it possible not only to free the single life from much disharmony and disease, but to improve the stock and quality of human beings. Thus the very nature and future of man may become imperceptibly the great responsibility of medicine.

The implications are clear as to the place of preventive medicine and public health in fulfilling the increasing obligations and the high purpose of the physician in medical practice and in research.

5. Gregg, Alan: The Future of Medicine, Harvard Medical Alumni Bulletin, October 1936.

**Forms of State Care for the Insane.**—At present (1937), some twenty-four states operate under well defined systems of state care. The county care plan is in practice in a few states, notably Wisconsin, Pennsylvania, Iowa and New Jersey. In still other states, no definite plan of public provision for the mentally ill has been formulated.—Deutsch, Albert: The Mentally Ill in America, New York, Doubleday, Doran & Co., Inc., 1937.

## OCCUPATIONAL DERMATOSES

### AN EDUCATIONAL PROGRAM

C. GUY LANE, M.D.
BOSTON

Diseases of the skin due to occupation represent from 10 to 12 per cent of all disease of the skin according to the best statistics available. They account for approximately 65 per cent of all disease due to occupational factors excluding industrial accidents. They cause considerable disability, usually partial but often complete. Such disability in most cases is temporary, but it must not be forgotten that sometimes it is permanent. Many thousands of dollars are lost in wages, and in addition large sums are paid for compensation and also for medical expenses.

Many diverse occupations are affected. Many cases are not recognized as possibly industrial until a considerable time has elapsed after the onset, and still more cases are not handled properly as industrial cases from the outset. In many the dermatosis is preventable, and often much can be done to lessen the disability. The preventive aspects of these diseases therefore need much more emphasis.

For these reasons, and perhaps others, considerably more publicity needs to be developed concerning occupational dermatoses. Much more information about their occurrence, causes, diagnosis, treatment and, especially, prevention needs to be presented to various groups over the country. In the first place, the public at large should be supplied with more information about this subject, perhaps by means of newspapers, magazines, including *Hygeia*, and public lectures. Workers of various classes, particularly of the occupations with the greatest hazards, need more instruction. Such instruction should be provided by employers with the help of insurance companies and safety engineering groups. Labor organizations, state boards of labor and hygiene and even federal agencies are doing much to make such material available for the worker. Employers too need awakening with reference to their responsibilities concerning this particular group of diseases, and various agencies could be called on to assist in their education. Insurance companies, better business bureaus, safety engineering associations and trade groups representing a particular industry are in a position to develop the facts for employers. The safety engineers are probably more awake to the problems than any other group, and their association, I believe, has the preventive phases at heart perhaps more than any other of the groups concerned.

Undergraduate medical students have comparatively little contact with such cases, and dermatologic courses in medical schools should of course include somewhat more about the occurrence, symptoms and prevention of the various industrial dermatoses that practitioners of medicine might have at their command more information about diseases of this type. Industrial nurses as a rule take over a factory position without a great deal of training in the subject but eventually develop by experience a good technic in their handling of cases which occur in their particular factory. A well trained industrial nurse can be a very efficient agent in the preventive management of industrial dermatologic con-

Read before the Section on Dermatology and Syphilology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

ditions, and courses in factory nursing should be developed in more centers throughout the country.

The members of the medical profession as a whole should have further information about occupational dermatologic conditions and should have their attention drawn to the frequency and to the various manifestations of these conditions. General practitioners, with their relatively limited experience with dermatologic conditions have not infrequently accepted erythema multiforme, scabies, lichen planus or even herpes zoster of the arm as of occupational origin. Some of these physicians may be performing part time industrial work in a neighborhood factory or shop and need considerably more information about the hazards and the manifestations which are possibilities in their particular industry. Full time industrial physicians have far more to do with industrial accidents, especially in view of the relatively small number of industrial diseases which occur in comparison with the accidents. While dermatologic conditions represent a major portion of the diseases, they may not occur with sufficient frequency, and the physician's knowledge of or interest in dermatologic conditions may not be sufficient, for him to estimate accurately the various cases as they occur. Courses should be available for these men to review their knowledge of dermatoses and their relationship to industrial processes. Dermatologists too are frequently not interested in the occupational phase. Their knowledge of processes and hazards is as a rule hardly sufficient for a correct classification of many cases as they occur. For industrial physicians, therefore, there should be evolved some plan of providing more data about the manifestations and about the processes in industry which may produce these manifestations.

Insurance companies, in many instances, are interested in keeping their claims as low as possible and frequently depend on general practitioners for a final diagnosis. They frequently delay consultation with a physician experienced in dermatologic conditions and trust that the patient's condition will clear up in time. With the insurance companies too the great preponderance of industrial accidents over industrial diseases makes it imperative that more attention be paid to them than to the diseases, with their smaller percentage of disability, yet these diseases, as a preventable condition, should receive more consideration. Most of the companies, however, do appoint capable specialists for the diagnosis of dermatologic manifestations and for advice with reference to treatment and the proper course to pursue in handling the cases.

Industrial accident procedure in various states differs greatly. It is too much to suppose that there will ever be a uniform procedure in all the states, but it is possible that greater publicity about the dermatologic phase of occupational claims would result in a greater degree of uniformity.

The groups which have been mentioned all need education: education with reference to the facts as they develop, education with reference to the possibilities of solving the problems outlined and particularly education with reference to preventive aspects. For the present, however, it is my purpose to discuss in more detail the matter of postgraduate medical training and teaching with regard to occupational dermatoses. I believe that such training or such teaching can be offered only in the larger cities, where there can be a definite coordination of all the organizations having an interest in these diseases. A definite central coordinating agency is necessary, but whether this is a graduate school, a hospital or a group of interested physicians makes little difference.

For postgraduate medical training, however, certain aids are indispensable for the providing of adequate instruction. In the first place, there should be facilities for demonstrating occupational dermatoses such as can be furnished only by a comparatively large dermatologic clinic, by the dermatologic clinics of several large hospitals or by cooperation with the clinics maintained by various large insurance companies. There also need to be available good library facilities for the reading and reference work which is necessary for providing adequate information. Facilities for investigation of causal factors and preventive methods should be made available. Opportunities should be developed for visits to factories and shops where there can be seen under proper guidance, perhaps of both a factory official and a physician, the details of those processes which have the highest potential hazards to the skin. There should be enlisted the cooperation of insurance companies, industrial accident commissions and state departments of labor and hygiene so that every aspect of the situation may be covered. Lectures and conferences should be utilized to cover the most important phases of these conditions, and adequate lists of references should be provided for the use of the students.

The subject matter for these conferences might well vary widely in different sections of the country, possibly with reference to the particular problems of a locality or perhaps with reference to the persons presenting themselves for instruction. For general practitioners and industrial physicians greater emphasis could well be placed on the recognition of dermatoses in general, as well as on the industrial and legal aspects. For dermatologists, there could well be less emphasis placed on dermatologic earmarks and greater emphasis on the processes involved and the insurance and legal phases of these conditions. It is quite necessary that there should be outlined at the very start, so far as humanly possible, criteria which can be accepted for the diagnosis of industrial dermatoses, as well as criteria for the cure of such conditions. These problems are not settled, by any means, but I believe that continual emphasis on them will contribute very largely to the eventual settlement of these most trying definitions. There needs to be emphasis in these conferences on occurrence and causal factors, as well as on the occupations which are affected. Possible manifestations and the different types of disease involved, as well as the differential diagnosis, need emphasis. As I have said before, there is needed not only diagnosis of the condition but so far as possible a diagnosis of the causal factor. Treatment and special prevention call for thorough discussion and a familiarity with studies which have been made in the past and the effect which such studies may have on the matter of prevention. The possible relationship of allergy, of syphilis and of fungous infections is sufficiently important to require detailed consideration. There is much information available with regard to trades and processes, and in the inspection of such processes in factory visits considerable attention should be paid to the details of processes used in the most common industries and to the preventive measures which have been developed.

When one comes to the consideration of compensation acts and the insurance aspects of the subject there is much material to be considered in these conferences.

It will help if these subjects can be discussed from the point of view of the insurance official, perhaps a claim adjuster, perhaps a safety engineer, perhaps a full time industrial physician. It may help to have a discussion of the loss of time, compensation, wages and medical expenses and the possibility of lessening these items by more attention to the subject of prevention. The mere fact of discussion by a member of a state compensation board, an official of the state department of labor and a representative of industry will bring to the speaker's mind, as well as to the minds of the listeners, the fact that the subject is a live one and of interest to others and will aid in concentrating attention on an important subject for consideration.

The work of the dermatoses investigation office of the National Institute of Health, maintained in New York City under the direction of Dr. Louis Schwartz, should be reviewed in some detail. The work which is being done by this office in the investigation of dermatologic hazards in industrial processes over a wide area deserves commendation. This office receives requests for information from many sources, abstracts and indexes available literature on occupational dermatoses, arranges for chemical or other examination and sends out information to manufacturers, insurance companies, physicians and others. Such work deserves extension in order that puzzling problems which are continually arising among workers with potential hazards may be investigated properly and an attempt at settlement made.

Such in brief are some of the subjects on which attention should be focused when postgraduate instruction is being provided for those physicians who come in contact with dermatoses of possible occupational origin.

Under the auspices of the Harvard School of Public Health there has been started a course based on such an outline. The course is planned to occupy one month and will be conducted through the cooperation of various agencies and under the direction of the assistant dean of the public health school. It is arranged that two mornings a week will be devoted to factory visits in industries with potential dermatologic hazards, and two mornings a week will be spent in lectures and conferences. Members will spend one morning in the outpatient dermatologic department of a large hospital observing, particularly, cases of possible occupational origin and some of the more common dermatoses to be reviewed, as well as the various manifestations of disease caused by fungi. One morning a week will be spent either with the state department of occupational hygiene in the investigation of possible dermatologic cases or in hearings of the industrial accident board to view the procedure of this board. Through the cooperation of various insurance companies three or four afternoons a week will be devoted to the observation of industrial dermatoses as seen in their clinics, and one afternoon will be devoted to library work on references and required reading for the course.

Such a program not only indicates the benefits to be derived from the cooperation of interested agencies but should provide much needed information for persons desirous of obtaining a wider knowledge of occupational dermatoses. It is reasonable to suppose that these diseases are bound to assume a greater importance in preventive medicine as time advances, and the medical profession should be prepared to assume the burden of providing adequate instruction in this branch.

416 Marlborough Street.

# THE INCIDENCE OF OCCUPATIONAL DERMATOSES AND THEIR CAUSES IN THE BASIC INDUSTRIES

LOUIS SCHWARTZ, M.D.
Medical Director, United States Public Health Service
NEW YORK

Of prime importance in the effort to control occupational dermatoses is the knowledge of their incidence and causes. Statistics on this subject have been compiled for many years in certain European countries. In the United States until four years ago such statistics were available only from nine states. Since then, however, there has been a marked increase of interest in this subject, and this year there are twenty-five states which gather statistics and have laws that compensate workers for disabling occupational dermatoses.

## INCIDENCE IN EUROPEAN COUNTRIES

In England between 1921 and 1929 there was an annual average of 769 cases of compensated occupational dermatosis, or about 56 per cent of all occupational diseases. In the three year period of 1930 to to 1932 inclusive there was an annual average of 1,368 cases of occupational dermatosis, or about 72 per cent of all occupational diseases.[1] In 1936 there were 1,771 cases of occupational dermatosis with an additional 142 cases of occupational epithelioma and eighty-four cases of chrome ulceration.[2] All other occupational diseases compensated in 1936 totaled 428 cases.

The three chief responsible agents were oils, alkalis and friction and heat, and the largest number of persons affected were engineers.

It is stated by English writers that these figures do not represent the actual incidence of occupational dermatoses, because only those cases in which the incapacitation is for one week or more and in which compensation is paid are reported. White[3] estimated that at least from eighteen to nineteen thousand cases occurred in England each year.

The yearly incidence of occupational dermatoses in Germany is not available, but in 1935 the number of reported cases of occupational diseases, not including dermatoses, was 8,601.[4] Of this number, 2,137 were in the metal industries.

There are no complete statistics from Italy, but Levi[5] found fifty cases of occupational dermatosis among 1,156 workers in a period of six months, or an annual rate of 9 per cent.

## INCIDENCE OF OCCUPATIONAL DERMATOSES IN THE UNITED STATES

In 1933 the nine states which kept records reported 5,787 cases of compensated occupational dermatosis in a total of 8,875 cases of occupational disease, or about 65 per cent.

The latest available records from five of these states show that occupational dermatoses are increasing and

Read before the Section on Dermatology and Syphilology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 13, 1938.

1. International Labour Office: Occupation and Health, Geneva, League of Nations, 1938, vol. 2, p. 861.
2. Golodetz, W. M.: Occupational Diseases Occurring in Factories and Workshops of Great Britain in 1936, Pub. Health Rep. 53:1367-1389 (Sept. 17) 1937.
3. White, R. Prosser: The Dermatoscope, ed. 3, London, H. K. Lewis & Co., Ltd., 1936, p. 6.
4. Berlin Letter, J. A. M. A. 108:741-742 (Feb. 27) 1937.
5. Levi, Italo: Considerazioni sulle comuni professionali, Dermosifilografia 5:1-37 (Jan.) 1937; abstr. Zentralbl. f. Haut- u. Geschlechtskr. 57:13-15 (Jan. 20) 1938.

other occupational diseases are decreasing, so that occupational dermatoses now comprise about 70 per cent of all occupational diseases, as shown by table 1.

### THE PROPORTION OF OCCUPATIONAL DERMATOSES TO ALL DERMATOSES

Many variable factors enter into the different estimates, the chief ones being (1) the percentage of the industrial workers to the general population and the prevailing types of industry in the localities where the estimates are made and (2) the criteria used in arriving at a diagnosis.

TABLE 1.—*Incidence of Occupational Dermatoses in Five States*

| State | Year | Occupational Diseases | Dermatoses | Year | Occupational Diseases | Dermatoses |
|---|---|---|---|---|---|---|
| Connecticut | 1932 | 537 | 388 | 1933 | 611 | 349 |
| Massachusetts | 1932 | 954 | 611 | 1933 | 735 | 504 |
| New Jersey | 1932 | 488 | 332 | 1933 | 419 | 290 |
| Ohio | 1934 | 1,382 | 902 | 1935 | 1,300 | 1,002 |
| New York | 1931 | 1,012 | 649 | 1927 | 1,764 | 1,125 |
| Total | | 4,573 | 2,944 | | 4,849 | 3,349 |

Fordyce [6] stated that occupational dermatoses are 2 per cent of all dermatoses. Lane [7] stated that they comprise from 4 to 5 per cent. White [8] gave the figure as 6 per cent. Gardiner [9] gave it as 7.5 per cent, and Knowles [9] estimated it at 10 per cent. Oppenheim [10] estimated that 20 per cent of all dermatosis is of occupational origin and stated that occupational eczema is the most frequent of all diseases of the skin.

In studies of the United States Public Health Service of records in New York free clinics in 1930, only fifty-eight cases in which the diagnosis was occupational dermatosis were found among 25,000 new cases of dermatosis. This is a very low percentage and may be due to the fact that the occupational histories of the patients were not carefully taken and patch tests were but seldom performed. Many cases of occupational dermatosis were probably lost in the large number in which a diagnosis of eczema or dermatophytosis was made.

A more accurate conception of the prevalence of occupational dermatoses can be obtained by studying their occurrence in various industries. The Public Health Service made studies among more than 100,000 workers in various factories and found that in the period of a year about 1 per cent of all workers in these factories were affected with occupational dermatoses. These figures do not include burns, splashes of acids or alkalis or pyogenic infections of occupational cutaneous wounds, which affected about 10 per cent of 72,000 workers in an automobile factory and about 10 per cent of 2,500 workers in a chemical and dye factory.

Because the workers in the industries listed are seemingly exposed to contact with strong alkalis, acids, solvents and oils, one would expect to find a larger percentage of occupational dermatoses among them than among workers in trades in which such primary irritants are not handled. Yet this is not necessarily true, because in most of the factories there are safety devices such as enclosed processes and forced ventilation which minimize the possibility of contact, and it will later be shown that just as many cases of occupational dermatosis are reported to occur among the workers in the domestic service, personal service and food-handling trades. Therefore it is conservative to estimate that 1 per cent of the industrial workers in the United States (not including clerical workers) are annually affected with occupational dermatoses.

### CAUSES OF OCCUPATIONAL DERMATOSES

The predisposing causes of occupational dermatoses are personal and environmental factors which impair the defense mechanism of the skin against external irritants. They are:

1. *Race.*—Race is a predisposing cause, as it has an anatomic and physiologic effect on the skin. It is well known among workers that Negroes and brunets are less susceptible to irritants of the skin than blonds. For this reason many factories will employ only Negroes or dark-skinned workers for jobs in which there is exposure to irritant chemicals. Workers with dark, thick, oily skin, like that of the Latin races, will withstand the action of such chemicals as soaps, turpentine and the volatile solvents better than workers with thin, dry skin. Workers with much hair on the legs and arms are more apt to acquire folliculitis from oils, grease and dirt than those with comparatively hairless skin. Workers with excessive sebaceous secretions are more likely to have occupational acne when exposed to oils and waxes.

2. *Perspiration.*—The perspiration normally acts as a mechanical remover and diluent of irritants coming in contact with the skin, but excessive perspiration, especially when combined with friction, may of itself irritate and macerate the skin and impair its resistance to irritants. Moreover, excessive perspiration may furnish the moisture necessary to make certain solid chemicals irritants, for instance by converting calcium oxide into slaked lime. The $p_H$ of the perspiration affects the solvent properties of chemicals and in this manner affects their action on the skin, because in order to be an irritant a solid chemical must be more or less soluble in the fluids of the skin.

TABLE 2.—*Yearly Prevalence of Occupational Dermatoses by Industries*

| Industry | Number of Workers | Number of Cases of Dermatosis | Percentage |
|---|---|---|---|
| Fabric dyeing | 3,800 | 76 | 2.0 |
| Fur dyeing | 1,600 | 17 | 1.0 |
| Rubber manufacture | 4,000 | 84 | 1.0 |
| Oil refining | 14,000 | 673 | 3.3 |
| Candy manufacture | 1,250 | 36 | 3.0 |
| Chemicals and dye manufacture | 2,500 | 170 | 7.0 |
| Synthetic resin manufacture | 700 | 53 | 7.5 |
| Rayon manufacture | 4,000 | 80 | 2.0 |
| Steel manufacture | 3,500 | 52 | 1.5 |
| Glass manufacture | 5,700 | 54 | 1.0 |
| Tanning | 565 | 20 | 3.5 |
| Automobile manufacture | 72,000 | 301 | 0.4 |
| Totals | 117,601 | 1,466 | 1.3 |

3. *Diet.*—The food one eats plays a part in the predisposition to occupational dermatoses by affecting the $p_H$ of the perspiration and by affecting the relative proportions of calcium, magnesium, sodium and potassium in the skin. A high calcium-potassium ratio with an increase in the total calcium was shown to be present in cases of heightened sensitivity of the skin and the reverse in cases of lowered sensitivity.[11]

6. Fordyce, J. A.: Occupational Skin Diseases, J. A. M. A. 59: 2043 (Nov. 23) 1912.
7. Lane, Guy C.: Industrial Dermatoses at the Massachusetts General Hospital, Arch. Dermat. & Syph. 6: 565 (Nov. 1) 1922.
8. Gardiner, F.: Brit. J. Dermat. 34: 297 (Oct.) 1922.
9. Knowles, F. C.: Eczema of External Origin and Its Relationship to Dermatitis, J. A. M. A. 68: 79 (Jan. 13) 1917.
10. Oppenheim, M.: Transcript of the London Dermatological Society, 1934, pp. 51-74.
11. Saito, Teiichi: Jap. J. Dermat. & Urol. 35: 482 (May) 1934.

4. *Age.*—Most of the workers affected with acute eczematoid types of occupational dermatoses are either young or new at the job, while the chronic eczematoid types of occupational dermatoses occur mostly in older workers.

5. *Sex.*—The reports from compensation boards show more men affected by occupational dermatoses than women. This may be because women usually pay more attention to personal cleanliness than do men, because they are not exposed to strong irritants or because there are fewer women employed.

6. *Season of the Year.*—Occupational dermatoses are more prevalent in warm weather, when little clothing is worn and contact with irritants is more likely to occur, but in those industries in which the work clothes become saturated with irritants or dust filters through the clothing dermatoses may occur more frequently in the winter, because the men are less apt to take cleansing shower baths after work when the weather is cold.

7. *Other Dermatoses.*—The presence of other diseases of the skin, especially of the itching type, with scratching breaking the skin and tending to rub in any irritant deposited on it, also predispose to occupational dermatitis.

8. *Cleanliness.*—Lack of cleanliness is the most important predisposing cause of occupational dermatitis. Lack of cleanliness in the work environment is as important as lack of personal cleanliness. The daily cleaning of floors, walls and machines, combined with a daily change to clean work clothes and compulsory shower baths after work, will do much to lessen the occurrence of occupational dermatoses.

9. *Hypersensitivity.*—A frequent predisposing cause of occupational dermatoses is hypersensitivity, and impairments of the defense mechanism of the skin are the most frequent causes of hypersensitivity. The presence of other dermatoses, breaks in the skin and slight variations from the normal in the anatomic or physiologic aspect of the skin accounts for a large percentage of hypersensitivity.

10. *Allergy.*—Hypersensitivity in which an external chemical coming in contact with the skin or being absorbed into the body through other channels causes the formation of antibodies is not a frequent cause of occupational dermatoses. It is, however, a frequent cause of dermatoses occurring among the users of manufactured goods. In many cases occupational dermatosis seemingly due to allergy will be found by careful study to be due to physical changes in the skin of the worker, to changes in the working condition or to contact with a primary irritant.

## ACTUAL CAUSES

Mechanical causes such as pressure, friction, abrasions and wounds are not in themselves frequent causes of occupational dermatoses, but they often open the skin to the action of chemicals and to bacterial infections.

Physical causes of occupational dermatoses are dry and wet heat causing burns and scalds; cold causing frost bite and chilblains; radium and roentgen rays causing burns and malignant changes in the skin of radiologists, and solar radiation causing sunburn, epithelial proliferations, melanosis and urticarial eruptions on the skin of some photosensitive open air workers.

Recent publications show that exposure to certain plants, perfumes and chemicals, especially those found in coal tar, renders the skin hypersensitive to solar radiation.

## BIOLOGIC CAUSES

The biologic causes are not in themselves frequent primary causes of occupational dermatoses, but they do cause a large percentage of occupational dermatoses by secondary infection of occupational wounds and other cutaneous lesions. They are (1) bacteria, (2) fungi and (3) parasites.

The principal occupational bacterial infections of the skin are folliculitis, boils, bacterial infections of occu-

TABLE 3.—*Distribution of the 3,136 Cases for Which the Industry or Occupation of the Affected Person Was Unknown, According to the Specific Materials Constituting Each of the Twenty-Five Major Groups of Materials*

| | No. of Cases |
|---|---|
| **1. Acids and acid fumes** | **170** |
| Acetic acid or acetic acid fumes | 4 |
| Citric acid | 1 |
| Fruit acids | 6 |
| Hydrochloric acid | 8 |
| Nitric acid | 1 |
| Oxalic acid | 6 |
| Sulfuric acid | 4 |
| Vinegar | 1 |
| Unknown or unspecified acids or acid fumes | 137 |
| **2. Alkalis and their compounds** | **498** |
| Ammonia | 13 |
| Calcium hydroxide | 5 |
| Caustic soda | 90 |
| Lime (calcium oxide) | 53 |
| Lye | 3 |
| Soap and soap solutions | 240 |
| Soda water | 27 |
| Sodium carbonate | 13 |
| Sodium hydroxide | 22 |
| Sodium silica | 2 |
| Alkali unspecified | 7 |
| **3. Biologic agents** | **35** |
| Fruits and vegetables | 2 |
| Fungi | 24 |
| Vegetables | 9 |
| **4. Building cement and concrete** | **45** |
| Cement, unspecified | 45 |
| **5. Burns and physical agents** | **42** |
| Friction | 12 |
| Trauma | 2 |
| Physical agent unspecified | 27 |
| **6. Chemicals unspecified** | **60** |
| Chemical unspecified | 60 |
| **7. Chromates and chromic acid** | **33** |
| Chromic acid | 33 |
| **8. Coal tar products** | **34** |
| Creosote | 3 |
| Naphthalene | 10 |
| Phenol, phenol oil and phenol products | 11 |
| **9. Cyanides** | **17** |
| Hydrocyanic acid | 1 |
| Potassium cyanide | 4 |
| Sodium cyanide | 1 |
| Cyanide unspecified | 11 |
| **10. Deodorants** | **24** |
| Perspiration | 16 |
| Sodium chloride | 6 |
| Sodium hypochloride | 1 |
| Sodium nitrate | 1 |
| **11. Dusts** | **55** |
| Inorganic | 1 |
| Organic: | |
| Cotton, lint | 3 |
| Flour dust | 9 |
| Leather dust | 2 |
| Spices | 4 |
| Starch | 2 |
| Wood dust | 8 |
| Organic dust unspecified | 10 |
| Dust unspecified | 14 |
| **12. Dyes and dye intermediates (fur dye not included)** | **22** |
| Cloth dyes | 20 |
| Ink | 2 |
| Leather dyes | 5 |
| Silk dyes | 3 |
| Dye unspecified | 12 |
| **13. Furs and fur dyes, hides** | **47** |
| Fur dyes | 43 |
| Furs | 3 |
| Paraphenylenediamine | 1 |
| **14. Halogens and their derivatives** | **11** |
| Chlorine solution | 9 |
| Hydrochloric acid | 1 |
| Hydrofluosilicic acid | 1 |
| **15. Metals and metal plating** | **340** |
| Aluminum | 1 |
| Mercury | 297 |
| Metal polish | 12 |
| Nickel | 6 |
| Plating acid or solution | 20 |
| Zinc | 1 |
| Metal unspecified | 3 |
| **16. Nonmetallic elements** | **7** |
| Arsenic | 3 |
| Sulfide | 2 |
| Sulfur dioxide | 2 |
| **17. Oils—vegetable (oils, fats and waxes)** | **4** |
| Oil—vegetable | 4 |
| **18. Paints, enamels and varnishes** | **33** |
| Lacquer | 7 |
| Lead paint | 3 |
| Varnish | 1 |
| Paint unspecified | 10 |
| **19. Petroleum products and greases (mineral oils)** | **220** |
| Cutting oils | 34 |
| Ethylene glycol | 1 |
| Mineral oils | 9 |
| Oil, essential | 1 |
| Oil, machine | 22 |
| Petroleum naphtha | 3 |
| Oil unspecified | 150 |
| **20. Plants** | **701** |
| Bulbs and flowers | 5 |
| Poison ivy | 170 |
| Plant unspecified | 526 |
| **21. Resin** | **14** |
| Bakelite | 4 |
| Metapora unspecified | 3 |
| Resin unspecified | 7 |
| **22. Rubber and its compounds** | **54** |
| Accelerators, catalysers used in the rubber industry | 34 |
| Accelerators, unspecified | 6 |
| Rubber cement | 2 |
| Rubber unspecified | 12 |
| **23. Solvents (other than mineral oils)** | **221** |
| Alcohols—ethyl, methyl, wood | 4 |
| Anilin | 10 |
| Benzene (benzol) | 4 |
| Benzine | 10 |
| Carbon tetrachloride | 2 |
| Celluloid acetate | 1 |
| Solution of formaldehyde | 11 |
| Gasoline | 72 |
| Hydroxybenzene | 2 |
| Kerosene | 2 |
| Nitrocellulose cement | 1 |
| Shoe cleaner and polish | 5 |
| Shoe dressing | 1 |
| Silk washing solution | 10 |
| Thinner | 1 |
| Toluene | 1 |
| Turpentine, varpentine | 60 |
| Solvent unspecified | 20 |
| **24. Miscellaneous** | **9** |
| Glue | 4 |
| Medicines | 3 |
| Sugar | 2 |
| **25. Unknown** | **357** |
| Dermatitis unspecified | 120 |
| Infection | 2 |
| Unknown | 235 |

TABLE 4.—*Incidence and Causes of Industrial Dermatoses Based on Cases Reported to the Division of Industrial Hygiene (Frequencies arranged in decreasing order of magnitude)*

| Industry or Occupation | Total, All Material Exposure | Petroleum Products and Greases | Solvents (Other than Mineral Oils) | Chromates and Chromic Acid | Alkalis and Their Compounds | Metals and Metal Plating | Dusts | Chemicals Unclassified | Dyes and Dye Intermediates (For Dye Not Included) | Plants | Rubber and Its Compounds | Building Cement and Concrete | Paints, Enamels and Varnishes | Synthetic Resins | Acids and Acid Fumes | Burns and Physical Agents | Cyanides | Biologic Agents | Coal Tar Products | Furs and Fur Dyes, Hides | Nonmetallic Minerals | Oils—Vegetable (Oils, Fats and Waxes) | Deodorants | Halogens and Their Derivatives | Miscellaneous | Unknown |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total** | 5,000 | 688 | 574 | 445 | 421 | 385 | 385 | 310 | 258 | 217 | 198 | 188 | 170 | 156 | 146 | 101 | 85 | 77 | 74 | 58 | 48 | 37 | 30 | 9 | 114 | 57 |
| 1. Metal industries (except iron and steel) | 712 | 68 | 52 | 295 | 19 | 168 | 4 | 14 | .. | .. | .. | .. | 21 | 2 | 12 | 4 | 24 | .. | 2 | .. | .. | 4 | 1 | 1 | 1 | 48 |
| (a) Electroplaters, platers | 203 | 1 | 7 | 198 | 4 | 168 | .. | 4 | .. | .. | .. | .. | .. | .. | 12 | .. | 24 | .. | 2 | .. | .. | .. | .. | .. | .. | 4 |
| (b) Other metal workers, polishers, workers in metals unspecified | 509 | 66 | 45 | 9 | 15 | 64 | 4 | 10 | .. | .. | .. | .. | 21 | 2 | 10 | 4 | 6 | .. | 2 | .. | .. | 4 | 1 | 1 | 1 | 44 |
| 2. Iron and steel industries | 264 | 252 | 59 | 13 | 19 | 71 | 15 | 10 | .. | 2 | 2 | .. | 21 | 11 | 15 | 15 | 11 | 1 | 2 | .. | 1 | 10 | .. | .. | 4 | 57 |
| 3. Machine operators, machinists and machinists' helpers* | 536 | 395 | 54 | 15 | 16 | 22 | 19 | 12 | 4 | 3 | .. | .. | 1 | 24 | 9 | 10 | 2 | 2 | 11 | .. | 4 | 2 | .. | .. | 7 | 16 |
| 4. Domestic and personal services | 487 | 2 | 67 | 5 | 288 | 7 | 7 | 21 | 17 | 10 | .. | .. | 2 | .. | 7 | 9 | .. | 12 | 4 | .. | 4 | 3 | 2 | .. | 5 | 20 |
| (a) Cleaners; dish washers, maids, etc.; janitors; porters | 155 | 2 | 60 | 5 | 103 | 7 | 5 | 4 | 3 | 10 | .. | .. | 2 | .. | 7 | 8 | .. | 10 | 4 | .. | 4 | 3 | 2 | .. | 5 | 20 |
| (b) Cleaning, dyeing, laundries at home or elsewhere | 67 | .. | 37 | .. | 15 | .. | 2 | 11 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 16 |
| (c) Barbers, beauty parlor employees, etc. | 65 | .. | 2 | .. | 5 | .. | .. | 12 | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. |
| 5. Food industries | 347 | 6 | 10 | 2 | 34 | 5 | 60 | 8 | .. | 17 | 1 | .. | 2 | .. | 16 | 7 | .. | 21 | .. | 6 | 3 | 7 | 10 | .. | 16 | 20 |
| (a) Bakers, confectioners, cooks, salad makers, etc. | 153 | 5 | 4 | .. | 11 | .. | 58 | 2 | .. | 3 | .. | .. | .. | .. | 16 | 3 | .. | 6 | .. | .. | 4 | .. | .. | .. | 16 | 20 |
| (b) Food handlers, grocery store and market workers, etc. | 139 | 1 | 2 | .. | 4 | 2 | 2 | 3 | .. | 12 | .. | .. | 1 | .. | 2 | 2 | .. | 11 | .. | 6 | 3 | 3 | 12 | .. | 14 | 20 |
| (c) Dairy and dairy products | 31 | .. | 3 | 2 | 17 | 3 | 1 | 3 | .. | .. | 1 | .. | 1 | .. | .. | 1 | .. | 3 | .. | .. | .. | .. | 3 | .. | 2 | 9 |
| (d) Fish or fish packing | 16 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | 9 |
| 6. Building and construction industries | 266 | 19 | 46 | 12 | 6 | 6 | 16 | 11 | 2 | 26 | 6 | 14 | 37 | 1 | 5 | 6 | 1 | 4 | 17 | .. | 4 | .. | 2 | .. | 2 | 27 |
| 7. Cement, glass and pottery industries | 267 | 10 | 14 | 3 | 19 | 1 | 25 | 5 | 1 | .. | .. | 180 | 1 | .. | 3 | 2 | .. | .. | 1 | .. | 2 | 1 | .. | .. | 1 | 16 |
| (a) Cement workers | 175 | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 180 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 |
| (b) Glass workers | 84 | 14 | 10 | 2 | 17 | 1 | 21 | .. | .. | .. | .. | .. | 1 | .. | 3 | 2 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | 6 |
| (c) Pottery workers | 18 | 1 | 4 | .. | 2 | .. | 4 | 5 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 9 |
| 8. Rubber industries | 264 | 6 | 19 | 2 | 7 | .. | 12 | 44 | .. | 6 | 164 | .. | 4 | 2 | 1 | 2 | .. | 2 | .. | .. | 5 | .. | .. | .. | 1 | .. | 9 |
| 9. Clothing and textile industries | 238 | 14 | 7 | 1 | 6 | 31 | 45 | 6 | 98 | 1 | .. | .. | .. | .. | 4 | 3 | .. | 2 | .. | 2 | 1 | .. | .. | .. | .. | 1 | 49 |
| (a) Clothing makers and manufacturers | 166 | 13 | 4 | 1 | .. | 2 | 25 | 6 | 73 | 1 | .. | .. | .. | .. | 3 | 3 | .. | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | 36 |
| (b) Hat makers, milliners | 45 | .. | 1 | .. | 1 | 29 | 1 | .. | 6 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | 6 |
| (c) Woolen mill workers | 44 | 1 | 2 | .. | 5 | .. | 20 | 2 | 11 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 9 |
| (d) Mattress and rug makers | 3 | .. | .. | .. | .. | .. | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 10. Chemical industries | 235 | 9 | 26 | 22 | 10 | 9 | 4 | 61 | 17 | 3 | 2 | 1 | 14 | 1 | 7 | 2 | 9 | 1 | 2 | .. | 3 | .. | .. | 2 | 13 | 10 |
| (a) Chemists, doctors, druggists, embalmers, laboratory workers, etc. | 116 | 1 | 7 | 15 | 5 | 4 | .. | 44 | 3 | 2 | 1 | 1 | .. | 1 | 5 | 2 | .. | 1 | 3 | .. | 1 | .. | .. | .. | 10 | 12 |
| (b) Dye manufacturers, paint and varnish manufacturers | 31 | 2 | 15 | 2 | 1 | 2 | 1 | 3 | 6 | .. | .. | .. | 14 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 4 |
| (c) Bleaching, coloring, printing cloth | 24 | .. | 1 | 2 | 2 | .. | .. | 6 | 8 | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 |
| (d) Developing films, photography | 22 | .. | 2 | 2 | .. | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| (e) Fertilizer workers | 17 | .. | .. | .. | 1 | 2 | 2 | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | 8 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| (f) Exterminators, insecticides | 5 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | 1 | .. |
| 11. Leather and fur industries | 230 | 1 | 30 | 6 | 4 | .. | 41 | 14 | 51 | 1 | 12 | .. | 2 | .. | 1 | 2 | .. | 2 | .. | 55 | .. | .. | .. | .. | 1 | 11 |
| (a) Leather and shoe workers | 176 | 1 | 30 | 5 | 4 | .. | 41 | 13 | 49 | 1 | 12 | .. | 2 | .. | 1 | 2 | .. | 1 | .. | 17 | .. | .. | .. | .. | 1 | 11 |
| (b) Fur dyers, furriers, fur workers | 44 | .. | .. | 1 | .. | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 38 | .. | .. | .. | .. | .. | .. |
| 12. Paper, printing and allied industries | 208 | 2 | 25 | 46 | 4 | 12 | 6 | 30 | 42 | 2 | 1 | .. | 2 | 1 | 6 | 2 | .. | 2 | .. | .. | 1 | .. | .. | .. | 5 | 13 |
| (a) Blueprinters, embossers, etchers, lithographers, printers | 165 | 2 | 20 | 46 | 4 | 12 | 2 | 22 | 32 | 1 | .. | .. | 1 | 1 | 6 | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | 1 | 9 |
| (b) Binders, paper and paper goods manufacturers | 41 | .. | 5 | .. | .. | .. | 5 | 8 | 10 | 1 | 1 | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | 4 | 4 |
| 13. Laborers* | 170 | 22 | 12 | 27 | 19 | 4 | 8 | 8 | 2 | 14 | .. | 1 | 4 | .. | 6 | 1 | .. | 1 | 4 | .. | 2 | 2 | .. | .. | 4 | 18 |
| 14. Transportation | 163 | 46 | 42 | 1 | 11 | 3 | 4 | 6 | 1 | 5 | 2 | .. | 3 | .. | 1 | 5 | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | 9 |
| 15. Molders and workers in plastics (bakelite, etc.)* | 130 | .. | 8 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 104 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| 16. Farmers, florists, gardeners, stock workers | 105 | .. | 1 | .. | 3 | 1 | 12 | 2 | .. | 71 | .. | .. | .. | .. | .. | .. | .. | 7 | .. | .. | 4 | .. | .. | .. | 1 | 3 |
| 17. Furniture industries | 86 | 5 | 14 | .. | 1 | .. | 20 | 4 | 11 | 1 | .. | .. | 15 | .. | .. | .. | .. | .. | 2 | .. | .. | 1 | .. | .. | 2 | 10 |
| 18. Clerical occupations | 77 | 7 | 2 | 5 | 3 | 2 | 6 | 7 | 12 | 2 | 2 | .. | 3 | .. | .. | 12 | 1 | 2 | .. | .. | .. | .. | .. | .. | 6 | 3 |
| 19. Highway and road workers, municipal workers* | 77 | 4 | 2 | .. | 2 | .. | 6 | 6 | .. | 26 | .. | .. | .. | .. | 1 | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 12 |
| 20. Salesmen* | 72 | 1 | 5 | .. | 3 | .. | 3 | .. | 26 | 5 | .. | .. | .. | .. | .. | 3 | .. | 1 | 2 | 9 | .. | .. | 1 | .. | 1 | 12 |
| 21. Workers in electrical supplies and equipment* | 62 | 6 | 3 | 4 | 2 | 4 | 2 | 9 | .. | .. | .. | .. | .. | 1 | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 6 |
| 22. All others* | 571 | 48 | 53 | 65 | 41 | 16 | 42 | 26 | 16 | 30 | 3 | 1 | 35 | 3 | 14 | 15 | 6 | 15 | 24 | 5 | 14 | 6 | 5 | 2 | 27 | 47 |

* Industry unknown or not elsewhere classified.

pational wounds, impetigo, erysipeloid, butcher's pemphigus, verruca necrogenica, vaccinia, anthrax and glanders. Of these, the first three are by far the most prevalent.

The principal fungi that cause occupational dermatitis are yeasts and Monilia in bakers and fruit and vegetable canners; Tinea in barbers, bath attendants and workers with animals or their hides, and Sporotrichum, Blastomyces and Actinomyces in horticulturists.

The principal parasites causing occupational dermatitis are Pediculoides ventricosus, causing grain itch; Ancylostoma, causing ground tich in miners, agriculturists and laborers; Carpoglyptus passularum, causing dermatitis among dried fruit handlers, and Acarus sarcoptes and Demodex, the parasites that cause mange in dogs and sometimes affects the skin of man.

## CHEMICAL CAUSES

The chemicals, including plants, are the most frequent causes of occupational dermatoses.

Some of the states compile statistics showing the causes of occupational dermatoses among their workers and the industries in which they occur.

From 9,116 cases of occupational dermatosis reported to the Public Health Service from a number of states, tables have been compiled showing the causes of occupational dermatoses and the industries in which they occur.

Table 3 shows the causes in 3,136 cases in which the industry was not given. The principal causes in

TABLE 5.—*Number and Percentage of Cases of Dermatosis by Major Material Classification; Cases Include Those with Industry or Occupation Known as Well as Unknown (Based on Tables 4 and 1)*

| Major Material Classification | Number | Percentage |
|---|---|---|
| Total, all classifications | 9,116 | 100.0 |
| Petroleum products and greases | 1,068 | 11.7 |
| Plants | 970 | 10.7 |
| Alkalis and their compounds | 919 | 10.1 |
| Solvents (other than mineral oils) | 885 | 9.7 |
| Metals and metal plating | 735 | 8.0 |
| Chromates and chromic acid | 478 | 5.2 |
| Dusts | 465 | 4.8 |
| Dyes and dye intermediates (for dyes not included) | 389 | 4.3 |
| Chemical, unspecified | 379 | 4.2 |
| Acids and acid fumes | 312 | 3.4 |
| Rubber and its compounds | 252 | 2.8 |
| Building cement and concrete | 221 | 2.5 |
| Paints, enamels and varnishes | 188 | 2.0 |
| Resin | 164 | 1.8 |
| Burns and physical agents | 142 | 1.6 |
| Biologic agents | 112 | 1.2 |
| Cyanides | 100 | 1.1 |
| Furs and fur dyes, hides | 100 | 1.1 |
| Coal tar products | 98 | 1.1 |
| Desiccators | 54 | 0.6 |
| Nonmetallic elements | 52 | 0.6 |
| Oils—vegetable (oils, fats and waxes) | 41 | 0.4 |
| Halogens and their derivatives | 77 | 0.3 |
| Miscellaneous | 123 | 1.3 |
| Unknown | 894 | 9.8 |

the order of frequency are plants, 22 per cent; alkalis, including building cements, 18 per cent; metals and metal plating, 11 per cent; solvents, 9 per cent; petroleum products, 7 per cent; dyes and dye intermediates, 4.5 per cent.

Table 4 contains an analysis of 5,980 cases according to industry and cause. The metal industries head the list, with over 30 per cent of all cases, and the domestic and food industries come second and third respectively. The building and construction industry comes next. In this industry the principal causes of dermatoses are the alkaline cements and concretes. Next on the list are the cement, glass and pottery industries, and in this group more than 93 per cent of the persons affected are cement and glass makers, with the alkalis as the chief irritants. The rubber industry, which some years ago furnished a high percentage of occupational dermatoses, comes next. The precautions against occupational diseases which have been adopted in this industry of late years account for the great decrease of occupational dermatoses in it.

TABLE 6.—*Causes of Dermatoses*

| Irritant | Number of Cases | Percentage |
|---|---|---|
| Alkalis | 1,169 | 32.0 |
| Petroleum products | 1,003 | 11.0 |
| Solvents | 1,003 | 11.0 |
| Plants | 970 | 10.5 |
| Metals and plating | 735 | 8.0 |
| Dyes, including fur dyes | 465 | 5.5 |
| Chromic acid and chromates | 478 | 5.2 |
| Acids | 312 | 3.5 |
| Rubber and its compounds | 252 | 2.7 |
| Resins | 164 | 1.8 |
| Physical agents | 142 | 1.5 |
| Biologic agents | 112 | 1.2 |

The apparently harmless clothing and textile industries come next, and it will be noted that they are just ahead of the hazardous chemical industry. This is so because the hazards in the chemical industry are recognized and proper safety precautions are taken and because the number of workers in the chemical industry in the states from which these statistics were gathered is probably not as large as the number in the clothing and textile industries. There are far fewer safety precautions, such as totally enclosed processes, protective clothing, compulsory shower baths and exhaust ventilation in the seemingly less hazardous industries than there are in the industries having well known hazards. Hence the skin of food handlers and domestic servants is exposed to the action of strong soaps and other cleaning solutions and the number of cases of dermatosis among them is second only to that among the workers in the metal industries.

The ten leading chemical causes of occupational dermatoses as shown in table 4 are (1) petroleum oils and greases, 14 per cent; (2) alkalis, including cement and concrete, 10 per cent; (3) solvents, 10 per cent; (4) chromic acid and salts, 7 per cent; (5) metals, including metal plating, 6 per cent; (6) dyes, 5 per cent; (7) plants, 5 per cent; (8) rubber and its compounds, 3 per cent; (9) paints and varnishes, 3 per cent; (10) synthetic resins, 2.5 per cent.

Table 5 gives a combined analysis of tables 3 and 4 as to cause. In this table the figures for alkalis should be combined with those for building cement and the figures for solvents with those for paints, enamels and varnishes. Arranged in this order the list reads as in table 6.

## SUMMARY

It is difficult to correlate accurately the records gathered by many observers from various localities and industries regarding the occurrence of occupational dermatoses. Nevertheless, these records combined with the inspections, studies and experiences of the United States Public Health Service in many of the leading American industries lead to the conclusion that the annual incidence of occupational dermatoses in the United States is at least 1 per cent for all industrial workers; that 30 per cent of the cases occur in the metal

industries; that the domestic and food industries come second and third, respectively, in furnishing cases of occupational dermatosis, and that alkalis, petroleum products, solvents, plants metals and metal plating, acids, including chromic acid, dyes, rubber compounds and resins are the leading chemical causes.

Sub-Treasury Building, Wall, Nassau and Pine streets.

## INDUSTRIAL DERMATITIS

### DEFINITIONS AND CRITERIA FOR DIAGNOSIS

MARION B. SULZBERGER, M.D.
NEW YORK
AND
CLARK W. FINNERUD, M.D.
CHICAGO

This communication forms only a small part of the present symposium on occupational dermatoses. We therefore assume that our exposition need not (and indeed cannot) be considered alone but is to be regarded as forming an integral part of the entire presentation.

For this reason we may here deal with specific isolated points and enter directly into their discussion without preamble. However, the first portion of this paper attempts to fulfil a function which is so fundamental and so necessary that it might well have been considered as an essential preface to the entire program.

Definitions, difficult and dry and disagreeable as they may be, are nevertheless an unavoidable necessity for intelligent discussion, and on close analysis one finds that many so-called scientific discussions are, unfortunately, based more on arguments as to definitions than on deliberations as to facts.

### DEFINITIONS

We believe that no one will quarrel with the following definitions of dermatosis and dermatitis:

A dermatosis is a disease, or pathologic condition, of the skin.

A dermatitis is an inflammatory disease or condition of the skin (i. e. a subcategory of dermatosis).

If we now define the words occupational and industrial and qualify these two definitions with them, we shall arrive at logical composite definitions of occupational dermatosis and dermatitis and of industrial dermatosis and dermatitis.

The Oxford dictionary[1] describes an occupational disease as "a disease incidental to one's occupation," and occupation is described as "an employment, business, calling." Moreover, it defines industry as "systematic work or labor, habitual employment, now especially in the productive arts or manufactures."

It will thus be seen that an occupational dermatitis may be defined as "an inflammatory condition of the skin incidental to one's occupation" (e. g. "housewife's eczema," dermatitis from golf clubs or plants in the golf instructor and dermatitis from the top of a desk or from dictaphone cylinders in the proprietor of a real estate business).

These definitions make clear that not all occupational dermatitis need also be industrial dermatitis. Industrial dermatitis must be regarded as a subcategory of occupational dermatitis; it is "an inflammatory condition of the skin incidental to systematic work or labor or habitual employment, especially in the productive arts or manufactures."

All this appears to be so simple and so forthright, so utterly beyond controversy, that it seems incredible that there should be difficulties in reaching a decision as to whether a given condition is or is not an inflammatory condition of the skin incidental to the patient's industrial employment.

It must be recognized, however, that not only nondermatologists and physicians outside of industry but even dermatologists and specialists in industrial medicine, unfortunately, will often be unable to decide whether certain conditions are of an industrial nature.

As we see it, three among the principal reasons for these almost constant difficulties are proper subjects for discussion here.

### I. THE TENDENCY TO CONFUSE PURELY MEDICAL CONSIDERATIONS WITH LEGAL INTERPRETATIONS

A first reason for the difficulty of medical decision seems to us to be based on the fact that physicians have often allowed themselves to become involved in questions of jurisprudence rather than of medicine. In the realms of language, of logic, of justice or of medicine an industrial dermatitis is any inflammatory disease of the skin for which any effect of industrial occupation can be proved to be a principal or major, causal or contributory, factor. In the eyes of the law, however, and for undeniably practical reasons, in many cases such a condition cannot today be compensated and therefore cannot be legally defined as industrial in nature. In other words, the question of the industrial nature of a disease is decided from the medical point of view by considerations which remain unchanged. The medical criteria remain the same regardless of laws, political boundaries, sociologic conditions, governments, policies, economic systems or times, whereas the actual legal definition as to what constitutes an industrial disease and particularly as to what is to be considered a compensable disease, the legal point of view in short, must vary according to all these factors. Thus it often suffices to cross a river or to step across a state line to find a complete change in the legal criteria as to the compensability in a given case. This condition of affairs has necessarily proved to be confusing, and the medical testimony has too often tried to go beyond the purely medical considerations and to answer the questions as to the legal status and as to the compensability in a given case. We believe therefore that physicians should confine themselves to the medical decision and always endeavor to ascertain as correctly and to state as clearly as possible the degree of probability with which the industrial exposure was or was not a major factor in a given case. We believe that the physician should not allow himself to be disturbed or distracted by the consequent interpretations or questions of legal status. The physician's answer can be clear: (1) "My findings lead me to conclude that the presenting dermatitis is in all probability to a major degree dependent on the patient's industrial exposures"; (2) "my findings lead me to conclude that the presenting dermatitis is not in all probability to a major degree dependent on the patient's industrial exposures," or (3) "the medical findings are such that I cannot decide whether the presenting dermatitis is or is not to a major degree dependent on the industrial exposures." These must be the three possible final conclusions permitted by the purely medical considerations, beyond which the physician cannot, and indeed should not, venture.

Read before the Section on Dermatology and Syphilology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

1. The Shorter Oxford English Dictionary, London, Oxford University Press, 1934.

However, even when the physician in this manner confines himself most strictly to medical decisions, why is it that he must so often say "I cannot decide whether the industrial exposure was or was not a major factor in this case of dermatitis"? While this admittedly unsatisfactory answer must frequently be given regarding other conditions as well, it is the only honest answer in a greater number of cases of "eczema" than of any other type of compensation cases. The reason lies in the inherent and peculiar difficulties which eczematous dermatitides present to an infinitely greater or more apparent degree than does any other category of industrial diseases.

### II. UNCHARACTERISTIC APPEARANCE AND COURSE OF ECZEMATOUS DERMATITIS

The second characteristic difficulty which so frequently renders the decision as to the causal role of industrial exposures particularly and peculiarly complicated in cases of industrial dermatitis is the fact that frequently the appearance and course of eczematous dermatitis is not characteristic, indicative or diagnostic of the actual causal agent.

The clinical manifestations of infection with a microorganism (e. g. tuberculosis, tinea, actinomycosis and anthrax) usually permit a conclusion as to the causal agent and often as to the time of the occurrence of exposure. Poisoning due to arsenic, lead, carbon tetrachloride, benzene or other volatile solvents regularly produces signs and symptoms from which the physician can determine the character of the noxa and thus often the approximate time at which the exposure occurred. The manifestations of such diseases as silicosis, of x-ray or tar cancer, of damage due to radium, as well as of a host of other conditions, often point directly and unmistakably to causal agents and to the place and time of the harmful encounter. For these reasons the proof of industrial causation is often as clear in the case of such conditions as in the case of industrial accidents and injuries.

With eczematous dermatitis, on the other hand, the situation is different. This difference must be recognized as being of the utmost practical significance when one realizes that industrial eczematous dermatitis seems to be by far the most common of all industrial diseases; that it is apparently so common that the number of cases of industrial dermatitis probably exceeds the number of cases of all other industrial diseases combined. Industrial eczematous dermatitis, like all other eczematous dermatitis and in contrast to those diseases in which the clinical picture often indicates the cause, has a clinical picture and course which do not as a rule permit a conclusion as to causal agents. For, while it is true that in many typical cases an expert can recognize, for example, whether a dermatitis is due to a plant such as poison ivy or to a dye such as paraphenylenediamine, it is equally true that dermatitides from plants, dyes, solution of formaldehyde, soap, gloves, a cosmetic preparation, a medicament, fungi or even friction and injuries may look and act exactly alike. They may then be clinically indistinguishable from one another even by the most experienced physician and may sometimes remain indistinguishable even after considerable investigation. The physician is thus often unable to decide whether or not in a given case the dermatitis is actually due to the industry or is due to some other home or non-industrial extrinsic or intrinsic factor. For these reasons, as well as for other reasons which will soon be discussed, special forms of investigation and special criteria are often necessary in attempting to reach an opinion as to the industrial or nonindustrial causation in a given case of dermatitis. We present these criteria in tabular form, the tables representing only a slight modification of similar tables previously published elsewhere.[2]

TABLE 1.—*Medical Definition and the Distinction Between Medical and Legal Criteria*

| |
|---|
| DEFINITION |
| An industrial dermatitis is any inflammatory disease of the skin for which industrial exposure can be shown to be a major causal, contributory or eliciting factor. (Industrial dermatitis is a subcategory of occupational dermatitis, for occupational dermatitis includes not only industrial dermatitis but also all other dermatitides attributable to any occupational pursuit.) |
| PROOF |
| For the physician the proof of the industrial nature of a dermatitis must depend entirely on medical and not on legal considerations. From the medical point of view there cannot be proof absolute of the wholly industrial nature of the disease in a given case, but there are nevertheless certain medical criteria which indicate with a high degree of probability whether or not in a certain case the dermatitis can be considered in major part attributable to the industrial occupation of the affected person. |

TABLE 2.—*Medical Criteria for Establishing Proof of the Probable Industrial Nature of a Given Dermatitis*

| |
|---|
| *Criteria of the First Order* |
| 1. *Inception:* The dermatitis appears at any time during a period of industrial exposure or even after a lapse of a reasonable incubation period following the cessation of the industrial exposure (usually a maximum of from two to three weeks). |
| 2. *Amelioration:* The dermatitis regularly disappears or is repeatedly improved within a reasonable period (days, weeks or even months) after cessation of the causal industrial exposure. (While this is usually the case, retention of causal agents, complications or ensuing polyvalent sensitization may prolong the course even for several years after the last industrial exposure.) |
| 3. *Recurrences and Exacerbations:* The dermatitis shows a tendency repeatedly to recur or to exacerbate when the worker returns to the identical industrial exposure after a certain period of absence (provided there has been no change in working conditions or in the patient's manner of working or in his susceptibility). |

It is obvious that with industrial dermatitides the situations which arise are often complex and extremely variable from case to case. For this reason a brief schematic presentation, such as these tables represent, cannot be expected to cover all contingencies or to fit all circumstances. These tables are intended only as a rough, rule of thumb guide, as a framework on which to build the actual structure of investigation and decisions applicable in the given case. It is to be hoped that, in spite of their many inevitable inadequacies, these tables will be of some assistance to physicians who are called on to make difficult decisions as to the industrial nature of certain dermatitides.

### III. SYNERGISTIC REACTIONS

Another difficulty encountered in determining whether or not a dermatitis is due to an industrial exposure lies in the fact that many eruptions are due not to a single simple cause but to an interaction of many causes and to a complex effect attributable to the cooperation of many factors. This may be termed the synergistic (synergic) action of various agents or the composite etiology of eczematous dermatitis.

2. Sulzberger, Marion B.: Determining the Industrial Nature of a Dermatitis, New York State J. Med. 34:1307 (Sept. 15) 1934.

According to present concepts, few if any diseases are due to one simple, uncomplicated effect or to a single causal agent. Even when the part of a single causal agent seems unequivocally dominant and is clearly discernible, it is necessary to recognize and to evaluate the role of preceding and/or concomitant contributory and predisposing factors. The complex interaction of various forces in the production of disease is perhaps most clearly apparent in the genesis of certain diseases of the skin, and it is probable that, for this reason, dermatologists were among the first to recognize and to describe and study the role of synergy in the pathogenesis of disease. Cases of eczematous dermatitis offer many striking examples of the importance of complex and synergic effects, and in the case of eczematous industrial dermatitis the complexity of etiologic factors presents constant difficulties to physicians striving to reach categorical decisions as to causation. The actual mechanisms of these synergic etiologic forces are just beginning to become amenable to scientific and laboratory study.

Among the long-recognized examples of synergy, we may mention first the fact that one allergen may sensitize the skin and that this first sensitization may be observed, by some unknown mechanism, to pave the way or bring in its train a subsequent sensitization to a second or third or greater number of perhaps entirely unrelated allergens. Cases which illustrate this effect are those in which sensitization to arsphenamine is followed by sensitization to bismuth or to mercury, so that subsequent to arsphenamine dermatitis the previously well tolerated preparation of bismuth or mercury cannot be administered without causing cutaneous manifestations. Among other examples of this type we may mention tuberculoid leprosy and tuberculoid syphilis, in which, as Jadassohn [3] pointed out, the hypersensitivity of the cutaneous lesions is present but is directed not only to leprolin and to luetin, respectively, but often also to tuberculin.

TABLE 3.—*Medical Criteria for Establishing Proof of the Probable Industrial Nature of a Given Dermatitis*

*Criteria of the Second Order (Adjuvant Criteria)*

1. The dermatitis appears first in, and is usually confined to, the areas of maximum exposure (in a small percentage of cases it spreads to, or may begin in, apparently unexposed areas or even becomes generalized).

2. The character and localization of the dermatitis correspond to the character and localization of dermatitis known in other cases to have been caused by exposure to the same or similar industrial hazards. (While many different substances and procedures can produce similar or identical eruptions, there are certain classes of substances and of procedures which regularly produce fairly characteristic lesions.)

3. The application of the presumptive causal agents to an unaffected site close to the site of the dermatitis produces a reaction, provided this application is made either during the active phase or after the proper interval following the cessation of the dermatitis.

4. The cutaneous tests produce reactions of the same fundamental nature as the dermatosis under investigation.

5. Other workers similarly occupied are or have been similarly affected.

6. The dermatitis appears soon (days or weeks) after the patient begins work involving new potential hazards.

7. The dermatitis is proved to be of possible occupational nature; that is, it is shown to be of the type which may result from the industrial exposure sustained. In this connection it must be determined that the dermatitis under consideration is not a nonindustrial eruption of such dermatoses as seborrheic dermatitis, psoriasis (including pustular psoriasis), parapsoriasis, lichen planus, dermatitis herpetiformis, multiform erythema, certain types of nonindustrial fungous and other infectious processes, nonindustrial impetigo and other pyodermas, acrodermatitis continua, nonoccupational drug eruptions, herpetic eruptions, nevoid and other anomalies of the skin, nonindustrial dermatitis exfoliativa, circumscribed neurodermatitis, atopic dermatitis and, particularly, nonindustrial contact-type dermatitis. (It must, however, be borne in mind that the presence of a nonindustrial dermatosis by no means excludes the possible coexistence of an industrial dermatitis. Moreover, the existence of a nonindustrial dermatosis may predispose to industrial dermatitis; and, on the other hand, industrial exposures may elicit attacks, prolong the course or produce exacerbations of such nonindustrial dermatoses.)

TABLE 4.—*Some Common Causes of Erroneous Conclusions That a Dermatitis Is of Industrial Causation*

*The dermatitis is erroneously considered to be industrial because:*

A. It is a dermatitis affecting a worker in an industry notorious for the occurrence of that type of dermatitis. (For example, dermatitis venenata may be due in the specific case to nonindustrial exposures; home exposures to dyes, cosmetics, toilet articles, insecticides, clothing, paint, varnishes or plants or exposures to substances encountered in hobbies or avocations, such as photography, painting or sports.)

B. It is accompanied by a reaction to a patch test with a substance or substances encountered in the industry. (Such a reaction to a patch test cannot be considered conclusive, for [1] it may be due to the application of a primary irritant or of a primary irritant concentration and [2] since the test never accurately reproduces the conditions of actual industrial exposure, a reaction may mean simply sensitivity of the skin to a certain substance when applied in a certain concentration and manner at a certain time to a certain site, while the same substance may be incapable of causing dermatitis under the actual conditions of industrial exposure.)

The common observations that quiescent sites of patch tests or quiescent sites of intracutaneous or other forms of skin tests may "flare up" when the same, or even when entirely unrelated, allergens are administered at a distant site are clear illustrations of synergy. In this category of phenomena we may also place many other well known dermatologic manifestations, such as those in certain fixed drug eruptions. One sometimes finds that areas first sensitized and at first reacting only on exposure to one specific drug, such as phenolphthalein, subsequently "flare up" after administration of a nonrelated drug, such as arsphenamine, a preparation of gold or a barbiturate. Moreover, the sensitivity to iodine often found with dermatitis herpetiformis and with acne vulgaris or the sensitivity to agar found with tertiary syphilis [4] necessitates the hypothesis that the disease agent has in some way produced a sensitivity—in the widest sense of the word—to unrelated substances (allergens?).

There are also the many instances in which it can be shown that infectious processes or sensitization to the products of micro-organisms lead to susceptibility to sensitization to nonliving allergens. The studies of Stokes and his associates [5] of the effect of seborrhea, of tinea and of other foci of infection in increasing the susceptibility to arsphenamine dermatitis, the cases in which a dermatitis clears up when the tonsils, gallbladder or other foci are eliminated and the case reported by Jadassohn [6] of a house painter who became susceptible to industrial exposures only after severe nephritis are but a few of the instances which could

3. Jadassohn, Josef: Bemerkungen zur Sensibilisierung und Desensibilisierung bei den Ekzemen, Klin. Wchnschr. **9**: 1680 (Sept. 3), 1734 (Sept. 17) 1923.

4. Stokes, John H.: A Luetin Reaction in Syphilis Produced by Agar: I. J. Cutan. Dis. **39**: 560, 1914; II. J. A. M. A. **68**: 1092 (April 14) 1917. Clauss, Max: Diagnostische Versuche mit Luetin-Noguchi München. med. Wchnschr. **61**: 1933, 1914. Sherrick, J. S.: The Effect of Potassium Iodide on the Luetin Reaction, J. A. M. A. **65**: 404 (July 31) 1915. Cole, H. N., and Paryzek, H. V.: The Provocation of the Luetin Test in Nonsyphilitic Patients, J. A. M. A. **68**: 1089 (April 14) 1917. Barker, Leslie P.: Value of Organic Luetin in Diagnosis and Treatment of Syphilis, Arch. Dermat. & Syph. **30**: 676 (Nov.) 1934.

5. Stokes, John H., and Caibcart, E. P.: Contributory Factors in Postarsphenamine Dermatitis with Special Reference to the Influence of Focal and Intercurrent Infection, Arch. Dermat. & Syph. **7**: 14 (Jan.) 1923. Stokes, John H., and Kukhar, G. V.: Infection-Allergic Complex in Arsphenamine Dermatitic Reactions, with Special Reference to Dermatophytosis, Brit. J. Dermat. **46**: 134 (March) 1934.

6. Jadassohn, Josef: Die Toxicodermien, Deutsche Klin. **10**: 117, 1905.

be mentioned here. Here also belong the almost innumerable cases of dermatophytosis leading to subsequent sensitizations and to subsequent dermatitis from simple chemicals or from other external contact allergens, as so well described by White and Taub,[7] Osborne and Putnam[8] and others.

In addition it is all too common to see the synergic relationship between allergens or noninfectious factors and infectious organisms illustrated in the reverse sequence. Recurrent herpes simplex is a common but excellent and striking example. It can be shown that chocolate, nuts, shellfish, drugs, sunlight or some other factor or factors, including psychoneurogenous effects, will in some cases allow or impel the dormant but ever present virus suddenly to produce characteristic manifestations, which may be reproduced by the same factors and often in the same sites with the regularity of a laboratory experiment. Mention may be made also of the clinically common and important appearance of exacerbations of dermatophytosis (sensitization to fungous products) subsequent to sensitization to simple eczematogenous allergens.

In short, among the dermatologic illustrations of complex etiologic and synergic effects there are an almost endless number and a practically infinite variety of well known and universally accredited phenomena which prove the thesis that the cause of most diseases of the skin is made up of not one but many factors. Many of these phenomena may be classified according to nomenclature as manifestations of either specific or nonspecific polyvalent sensitizations (Jadassohn, Bloch) and many can be placed in the category of either metallergy or parallergy (Urbach) or of biotropism of Milian.

In addition to this summation or potentiation of allergenic effects, one must bear in mind the effects of constitutional, acquired or hereditary, permanent or transitory, local or systemic, predisposing causes. These may be simple, such as too dry and too easily fissured skin and ichthyosis, too oily skin, hyperhidrosis, or lack of adequate protective sebum, protective pigment or elastic fibers. Or they may be more complex, such as atopy, hepatic insufficiency, diabetes or circulatory disturbances. The predispositional factors may be toxic or metabolic (e. g. absorption of bacterial toxins or products from the gastrointestinal tract and porphyrin), or they may be due to products of faulty digestion or to a deficiency, such as an insufficient vitamin supply, inadequate vitamin retention or faulty vitamin utilization. To all these physicochemical factors we must not fail to add the imperfectly understood, highly complicated and all too frequently invoked, but nevertheless sometimes undeniably present and occasionally quite apparently potent, influences of psychic and emotional states[9] and the synergy of these states with any or all of the mentioned factors.

Our exposition of this phase of the subject is deliberately rudimentary, and we have made it a point to mention only a few of those synergistic phenomena which would immediately present themselves to the mind of the dermatologist. Not one of our examples is new, and almost all the mentioned categories, as well as many others, have been discussed and studied by dermatologists for over forty years. Persons who are interested in further details and in a masterly exposition of many of the early phases of this subject are advised to read the pertinent original contributions of Josef Jadassohn.[10]

In spite of the innumerable and long-established clinical observations and facts in this field, the exact mechanism of etiologic synergy and of complex additions and multiplications of effects has scarcely begun to be understood. It is therefore most welcome that laboratory workers are beginning to become cognizant of these matters and that it may be hoped that experimental studies will soon bring some greater measure of understanding. Examples of the increased volume of recent laboratory work which touches on these problems are the studies of Luithlen, Hahn, Mayer and Sulzberger,[11] Sulzberger and Oser[12] and Cormia[13] on the effects of diets and environments in the inhibition and augmentation of susceptibility to sensitization; Pillsbury and Sternberg[14] on the sugar content and irritability of the skin; Dienes and Schoenheit[15] on the synergism of tuberculin or tuberculosis and simpler

TABLE 5.—*Some Common Causes of Erroneous Conclusions That a Dermatitis Is Not of Industrial Causation*

| *The dermatitis is erroneously considered to be nonindustrial because:* |
|---|
| A. It is accompanied by the finding of fungi or other micro-organisms in the lesions or in a distant focus. (Fungi, pathogenic and nonpathogenic, and certain other micro-organisms, e. g., staphylococci, streptococci, yeasts and molds, are almost universally found on the skin of adults in the United States. Their demonstration does not therefore constitute proof that a dermatosis is of nonoccupational nature.) |
| B. It is accompanied by a cutaneous reaction to tests with extracts of fungi or of certain other micro-organisms. (Such reactions are too common to be of weight in ruling out the industrial nature in a given case; they merely show that the patient has had a prior sensitizing exposure to the same or to an immunologically related micro-organism; they are comparable to reactions to tuberculin in the general population.) |
| C. The reactions to patch tests with the substances of the industrial exposure are negative. (Such negative results of patch tests cannot be considered conclusive. They may be due to: [1] Local differences in sensitivity. The area tested may not be hypersensitive, while other areas, particularly the areas involved, may be hypersensitive. [2] Chronologic differences in sensitivity. A person's skin, sensitive at the time of industrial contact, may be nonsensitive to the actual causal substances at the time of testing. [3] The fact that the actual causal substance or substances or the causal combination or causal intermediates may not have been applied. [4] The fact that the concentration employed may have been too weak, that the test application may have been otherwise inadequate or that the vehicle employed may have been incorrect or may have prevented penetration or exerted some protective or neutralizing effect; e. g. water instead of sweat, fat or oil instead of an aqueous vehicle or vice versa, acid instead of alkali or vice versa. [5] The fact that the test never accurately reproduces the actual conditions of industrial exposure. Repeated contact, friction, maceration, heat, cold, sweat or other industrial agents or processes may be necessary additional factors enabling the substance, giving negative results in the test, to cause dermatitis under conditions of industrial exposure.) |

7. White, Cleveland, and Taub, S. J.: Sensitization Dermatoses of Nonfungous Nature Following Superficial Fungous Infections ("Ringworm") of Extremities, J. A. M. A. **98**: 524 (Feb. 13) 1932.

8. Osborne, Earl, and Putnam, E. D.: Industrial Dermatoses with Special Reference to Allergy and Mycotic Dermatitis, J. A. M. A. **99**: 972 (Sept. 17) 1932.

9. Stokes, John S., and Pillsbury, Donald: The Effect on the Skin of Emotional and Nervous States, Arch. Derm. & Syph. **22**: 962 (Dec. 30) 1930.

10. Jadassohn, Josef: Zur Kenntnis der Medicamentosen Dermatosen, Verhandl. d. deutsch. derm. Gesellsch., 1896; Theoretisches und Praktisches zur Ekzemlehre, Ztschr. f. ärztl. Fortbild. **26**: 145 (March 1) 1929; A Contribution to the Study of Dermatoses Produced by Drugs, Selected Essays and Monographs **170**: 207, 1900; Hematogenous Infectious Diseases of the Skin, Arch. Derm. & Syph. **21**: 526 (April) 1930; footnotes 3 and 6.

11. Mayer, E. L., and Sulzberger, Marion B.: Zur Frage der jahreszeitlichen Schwankungen der Krankheiten: Der Einfluss der Kost auf experimentelle Sensibilisierungen, Arch. f. Derm. u. Syph. **168**: 245, 1931.

12. Sulzberger, Marion B., and Oser, Bernard L.: Influence of Ascorbic Acid of Diet on Sensitization of Guinea Pigs to Neosalvarsan, Proc. Soc. Exper. Biol. & Med. **32**: 716 (Feb.) 1935.

13. Cormia, Frank E.: Experimental Arsphenamine Sensitization, J. Invest. Dermat. **1**: 199, 1938.

14. Pillsbury, Donald M., and Sternberg, T. H.: Relation of Diet to Cutaneous Infection, Arch. Dermat. & Syph. **38**: 893 (May) 1937.

15. Dienes, L., and Schoenheit, E. W.: Certain Characteristics of the Infectious Processes in Connection with the Influence Exerted on the Immunity Response, J. Immunol. **20**: 41 (July) 1930.

protein allergens; Burky [16] in his important work on the synergism of bacterial toxins and sensitization to body-own substances (lens, muscle); Swift and Schultz [17] on the same subject; Shwartzman and his co-workers [18] on the synergism of certain bacterial endotoxins as local factors preparing the skin to respond with hemorrhagic lesions on hematogenous exposure to a variety of eliciting agents which when acting alone are incapable of producing this effect; Schwentker and Rivers [19] on the synergism of virus and cerebral and neural lipoid extracts in enhancing the formation of organ-specific antibrain (antimyelin) antibodies, and Rous and Beard [20] and Rous and Kidd [21] on the synergism of Shope papilloma virus, of tar and of scarlet red in the more rapid production of carcinomatous changes in the rabbit's skin. Extensive experimental studies of this type justify the hope that greater clarity will soon be forthcoming and that the clinician may some day be helped materially in his endeavor to determine the relative significance of various factors in the production of a single disease in each particular case.

In the field of industrial dermatology today the complications arising from factors such as those described and the difficulties of determining the exact proportion of causal effect attributable to any single factor or group of factors still represent the greatest, often insurmountable, handicaps in the attempt to decide as to the industrial nature of a dermatitis.

We shall cite only two examples here, both taken from actual experience and both surely duplicated ad infinitum in the practice of all industrial dermatologists.

The first illustrates the fact that an industrial exposure may lead to or predispose toward subsequent irritation of the skin from nonindustrial causes:

Case 1.—A worker previously without dermatosis was exposed to solution of formaldehyde. Sensitization developed. A proved formaldehyde dermatitis appeared on the hands, arms and face. Subsequent to this, for a period of years and without any apparent further exposure to formaldehyde, a chronic recurrent eczematous dermatitis ensued. Mycelisums of fungi were found in the new eczematous eruption on the feet and toes.

In a case such as this what proportion of blame shall attach to the industrial sensitization?

The second case illustrates a second large class of common complications, namely those based on the fact that nonindustrial factors may lead to or predispose toward subsequent irritation of the skin from industrial exposure:

Case 2.—An employee who as far as could be ascertained had never before suffered from a dermatosis took a therapeutic dose of a proprietary preparation containing quinine. From this time on she found it impossible to continue her work as a beauty shop operator because of chronic recurrent dermatitis of the hands and face. Patch tests proved her to be strongly hypersensitive to quinine. When she stayed away from her work the dermatitis disappeared, only to recur on each return to the previous occupation.

In this case how shall the physician answer the question as to whether or not the occupational exposure represents a major factor?

Innumerable multiplications and modifications of these two types of sequence are possible. There are the cases in which fungous infections lead to subsequent industrial dermatitis, and vice versa. There are the cases in which nonindustrial exposures (sunburn, trauma, sensitizations) lead to specific monovalent or polyvalent industrial sensitivity or simply to nonspecific polyvalent irritability leading, in turn, to industrial dermatitis. There are the countless cases in which not only do one industrial effect and one extra-industrial effect act as synergists but many synergistic forces are at work. These forces may be the result chiefly of industrial exposures, or they may be distributed in any proportion between nonindustrial and industrial causes. A most common combination of multiple causation is seen, for example, in the case of dishwashers, soda fountain clerks and others engaged in occupations entailing prolonged exposure to water, soap and other cleansers. Maceration, plus caustic action, plus the extraction of protective sebum, plus infection of the skin with micro-organisms such as cocci, yeasts and other fungi, plus friction, plus allergens and irritants (e. g. from nickel plate, from vegetables, from fruit juices) plus a definite degree of extra-industrial local or constitutional predisposition form the most frequent causal combinations.

## CONCLUSION

Although we feel that we have outlined a sketch rather than painted a picture, we believe that our presentation may suffice to convince that our subject is complicated and full of innumerable difficulties and pitfalls. Because of the complexity of the subject we have employed the accompanying tables, which at first glance undoubtedly appear to be unnecessarily complicated and lengthy. Because of this complexity, moreover, we freely admit a conviction that such tables, no matter how detailed, will all too frequently prove to be wofully inadequate.

We should like to emphasize the following points:

1. For the physician the question of deciding as to the industrial nature of the dermatitis in a given case should remain a purely medical one.

2. The nondiagnostic appearance of many eruptions of eczematous dermatitis and the synergistic action of complex factors in their causation, as well as other special complicating factors, often make it impossible to decide what portion of causal blame shall attach to industrial exposures.

3. The complexity and intricacies of these problems are such that (*a*) they urgently require further clinical and, especially, further laboratory study; (*b*) only impartial experts can be expected to hold valued opinions as to moot cases, and (*c*) in many cases even the longest and most painstaking study, even the most logical, complete and exact tables of criteria and even the greatest experience and clinical acumen leave the honest physician no alternative but to answer "In this case I do not know and cannot determine whether or not the industrial exposure was the major factor."

962 Park Avenue, New York—55 East Washington Street, Chicago.

16. Burky, Earl: The Production in the Rabbit of Hypersensitive Reactions to Lens, Rabbit Muscle and Low Ragweed Extracts by Action of Staphylococcus Toxin, J. Allergy 5:466 (July) 1934.

17. Swift, Homer F., and Schultz, Mark P.: Studies in Synergy: The Synergic Action of Staphylotoxin and Beef Lens Extract in Rabbits, J. Exper. Med. 60:701 (May) 1934.

18. Shwartzman, Gregory: Studies on Bacillus Typhosus Toxic Substances, J. Exper. Med. 48:347 (Aug.) 1928; Phenomenon of Local Tissue Reactivity and Its Immunological, Pathological and Clinical Significance, New York, Paul B. Hoeber, Inc., 1937.

19. Schwentker, Francis F., and Rivers, Thomas M.: The Antibody Response of Rabbits to Injections of Emulsions and Extracts of Homologous Brain, J. Exper. Med. 60:559 (Nov.) 1934; Encephalomyelitis Accompanied by Myelin Destruction Experimentally Produced in Monkeys, J. Exper. Med. 61:689 (May) 1935.

20. Rous, Peyton, and Beard, J. W.: The Progression to Carcinoma of Virus-Induced Rabbit Papillomas, J. Exper. Med. 60:523 (Oct.) 1935.

21. Rous, Peyton, and Kidd, J. G.: The Carcinogenic Effect of a Papilloma Virus on the Tarred Skin of Rabbits: I. Description of the Phenomena, J. Exper. Med. 67:399 (March) 1938.

# THE PRACTICAL ASPECT OF THE PREVENTION OF INDUSTRIAL DERMATOSES

EARL D. OSBORNE, M.D.
AND
JAMES W. JORDON, M.D.
BUFFALO

It is generally admitted that industrial dermatoses are responsible for from 40 to 60 per cent of all claims for the payment of compensation in the United States.[1] This percentage varies depending on the type of industry chiefly present in the individual states. The more highly industrialized the state or country, the higher is the percentage of claims as a result of industrial dermatoses. It is obvious that effort directed toward the reduction of the incidence of industrial dermatoses would materially reduce both the direct and the indirect cost of these conditions to the employer, the employee and the public. It is our belief that the cost of industrial dermatoses could be reduced at least 50 per cent if all the scientific facts now available were put to use. It is our purpose in this paper to summarize these facts and to discuss their application.

It is impossible to discuss in one paper the prevention of all cutaneous disease arising as a result of industrial injury. Therefore we will discuss only the more common and important industrial dermatoses, especially industrial dermatitis, which represents by far the greatest problem in industrial cutaneous medicine.

## INDUSTRIAL DERMATITIS

Industrial dermatitis is the most common cutaneous hazard in American industry. It outranks all other industrial conditions of the skin from the standpoint of time lost from work, money spent in compensation, suffering and unemployment. The term industrial dermatitis includes (*a*) inflammation of the skin due to primary irritants, such as strong acids, alkalis, metallic salts, soaps, cleansers and physical agents, in nonallergic persons and (*b*) sensitization dermatitis, in which a specific cutaneous sensitivity is the underlying factor. In the case of dermatitis due to primary irritants, the first contact with the irritant in sufficient concentration, or prolonged contact with weaker dilutions, is capable of setting up the dermatitis. In the case of dermatitis due to specific cutaneous sensitivity, a well defined period of sensitization is necessary, during which period the substance is handled with impunity unless in sufficient concentration to produce primary irritation. After sensitization develops, the subject reacts to a dilution of the allergen far greater than that necessary to produce dermatitis in a normal or unsensitized person. Many substances used in industry are not only primary irritants and thus capable of producing dermatitis in normal persons but also cutaneous sensitizers capable in minute amounts of producing a characteristic sensitization dermatitis. This phenomenon is particularly prevalent in the case of persons who come in contact with turpentine, gasoline, chromium, soaps, alkalis, certain acids, chemical salts or formaldehyde. It is of the utmost importance in the prevention of industrial dermatitis to differentiate at once between an inflammatory reaction due to primary irritation and an inflammatory reaction due to the development of true hypersensitivity. According to our experience, persons who have suffered from a primary chemical irritation are much more liable to have a true sensitization dermatitis with further repeated contacts with the chemical.

From the Department of Dermatology and Syphilology, University of Buffalo School of Medicine.

Read before the Section on Dermatology and Syphilology at the Eighty-Ninth Annual Session of the American Medical Association, June 13, 1938.

1. Levin, O. L.: Industrial Dermatitis: Description, Causes, Diagnosis, Prevention, Treatment, Indust. Med. 4: 534-541 (Oct.) 1935. Eller, J. J., and Schwartz, Louis: Industrial Dermatoses: Causes, Prevention, and Treatment, New York State J. Med. 35: 951-964 (Oct. 1) 1935. Schwartz, Louis: Industrial Dermatitis in the United States, Am. J. Pub. Health 23: 1049-1054 (Oct.) 1933.

### DERMATITIS FROM PRIMARY IRRITANTS WITH NO ALLERGIC FACTOR

Many chemicals and industrial compounds are capable of producing dermatitis in workers who have no specific cutaneous sensitivity. Among these substances are acids, alkalis, hypertonic solutions, soaps, gases, vapors, fat solvents, cement, plaster, lye, metallic oxide and hot water. These agents may exert their action on the skin, according to White,[2] by (1) dissolving the horny layer, (2) dissolving the protective natural grease on the skin, (3) protein precipitation, (4) desiccation, (5) dissociation or hydrolysis in water to form irritating compounds from nonirritating substances, (6) oxidation or (7) reduction. The type and degree of reaction depends on the character of the substance, the concentration and the degree of exposure to the irritant. Persons do not all react in the same manner to these irritants. Anatomic and physiologic differences in workers' skins play an important part. Persons with thin blond skin or with dry, ichthyotic skin whether it is the result of congenital ichthyosis, old age or environmental conditions are more readily affected. Primary irritative dermatitis is more prevalent during the winter months, when the sebaceous and sweat glands are less active and the humidity is low in homes and workshops.

### PREVENTION OF NONALLERGIC IRRITATIVE DERMATITIS

Although the incidence of nonallergic irritative dermatitis in American industry is high,[3] there is little excuse for its development, since for its production relatively high concentrations or long periods of exposure are required. Mechanical means of protection and education of the worker will usually suffice to prevent this type of dermatitis. Protection includes the use of acid-resisting and alkali-resisting gloves, aprons and shields. Impervious pastes are sometimes of great value. Adequate facilities for cleansing the exposed parts should be readily available.

Irritating fumes and dust should be removed at their source by properly installed suction hoods and adequate ventilation. This type of apparatus has proved its efficacy in numerous lines of industry.[4] Obviously such removal calls for close teamwork between the industrial engineer and the industrial dermatologist.

In many instances a simple irritative dermatitis is caused by agents used to cleanse the skin after work rather than by substances handled in the course of the daily job. Fat solvents, such as gasoline and turpentine, and strong alkalis, including soaps used to cleanse the skin after work, have frequently been found to be the cause of an irritative type of dermatitis.

2. White, R. P.: An Outline of Industrial Skin Diseases, Indust. Med. 4: 47 (Jan.) 1935.

3. Schwartz, Louis: Sensitivity to External Irritants in Industry, New York State J. Med. 36: 1968-1976 (Dec. 15) 1936.

4. (*a*) Bloomfield, J. J.: Engineering Control of Occupational Diseases, Pub. Health Rep. 51: 635-647 (May 22) 1936. (*b*) Beyer, D. S.: Mechanical Control of Occupational Diseases, National Safety News, August 1933. (*c*) Riley, R. C., and Goldman, F. H.: Control of Chromic Acid Mists from Plating Tanks, Pub. Health Rep. 52: 172-176 (Feb. 5) 1937. (*d*) Schwartz, Louis: Dermatitis from Synthetic Resins and Waxes, Am. J. Pub. Health 28: 586-592 (June) 1938.

As stated previously, a simple irritative nonallergic dermatitis is in most instances preventable. It may lead to a more complex, disabling sensitization dermatitis. This is well illustrated by the following case:

A valued workman who had been with a high class wallpaper concern for thirty years had a turpentine burn on his fingers, which, although he was warned, recurred over a period of five or six years. Contrary to instructions, he continued to come in contact with full strength turpentine from time to time. Suddenly, for no apparent reason, he had extensive dermatitis on the hands, forearms, face and neck. He reacted violently to a 1 to 500 dilution of turpentine in liquid petrolatum. He had generalized exfoliative dermatitis after further exposure and has since been unable to enter a room in which turpentine is present in the air. In addition to being disabled for nearly two years, he has had to seek other work at a fraction of his former salary. Adequate prevention of contacts in the first place, with the prevention of irritative dermatitis, would in all probability have prevented the subsequent sequence of events.

Not only does primary irritative dermatitis lead to sensitization dermatitis to the same substance but, as is well known and recognized by dermatologists, any area of inflamed skin easily acquires further sensitivities to contacting allergens. We believe that simple irritative dermatitis should never be passed over lightly but that adequate means of protection should be provided and the employee warned regarding further contact with the offending substance.

### SENSITIZATION DERMATITIS

Experience has shown that almost any chemical compound will produce sensitization dermatitis if the duration of exposure and concentration are sufficient. With the rapid advance of chemical research and the development of new chemical compounds, the number of these substances is daily getting larger and larger. Not only are workmen exposed to numerous eczematizing agents at work but also they are exposed in their homes and during their periods of recreation to a whole gamut of potential cutaneous allergens.

Many industries present greater hazards than others. Workers with dyes,[5] formaldehyde,[6] lacquers,[7] turpentine,[8] chromium,[9] nickel,[10] resins [4d] and munitions [11] are more apt to be sensitized than workers in other industries.

### PREVENTION OF SENSITIZATION DERMATITIS

The prevention and control of sensitization dermatitis is the greatest problem confronting the industrial dermatologist. The development of severe sensitization dermatitis may mean weeks or months of disability and, too often, a change in occupation. Frequently, at least in cases of severe involvement, multiple sensitization occurs. Instead of reacting to one offending allergen, the workman then reacts to many substances, not only at work but at home. The problem of preventing sensitization dermatitis primarily resolves itself into four phases: (1) the proper selection of workers, (2) the elimination of unnecessary hazards, (3) the prevention of exposure to sensitizing substances and (4) the early recognition of sensitization dermatitis and the prevention of further contacts with substances having a high sensitization index.

Before these different phases are discussed in detail, it is necessary to summarize some of the pertinent facts regarding sensitization to chemical compounds. It is well known that certain persons are more easily sensitized than others. Some persons become sensitized with the first contact and others only after weeks, months or years of repeated exposures. It has been repeatedly demonstrated that all persons become sensitized more readily with strong concentrations than with weak. The greater the degree of exposure, the more certain it is that sensitivity will develop. Once it has developed, it may remain present for years or gradually decrease in severity and finally disappear. Wedroff and Dolgoff [12] carried out some experiments of great significance to industrial dermatology. They were able to sensitize experimentally with one application of 0.03 cc. of 10 per cent dinitrochlorbenzene fifty of seventy-two patients who had had eczema. An incubation period of from eight to twenty-four days was required before the development of sensitization. Sensitivity to this compound increased more than 100,000 times the original degree, and spontaneous regression of sensitivity required from 200 to 360 days. They found that patients with eczema were much more readily sensitized than normal persons, who required 0.3 cc. of a 30 per cent solution of the same compound to produce sensitivity. Repeated applications on patients already sensitized increased the degree and duration of sensitivity. It is apparent that patients with an eczematous eruption are much more easily sensitized to other compounds than are normal persons. This brings us to the question of the selection of workers in industries employing substances with a high sensitizing index.

*Selection of Workers.*—With few exceptions, one type of skin is just as easily sensitized as another. Certainly a heavy horny layer on the exposed parts is advantageous in preventing penetration of offending allergens. We have not observed that age, or color of skin except possibly in the case of Negroes, is of great importance. In certain industries a dry skin is advantageous. In others a moist skin is just as advantageous. A dry skin is desirable in industries where gases and dusts are present. A moist skin is desirable where liquid irritants are employed. Therefore it is evident that no general statement can be made regarding the desirability of dry or moist skin unless the type of industry is specified.

The preemployment performance of patch tests with substances to be handled in the work is of almost no practical importance. The reason for this is that the worker never reacts to the first contact with a substance. An incubation period, during which sensitization develops, of at least ten to fourteen days is necessary before a positive reaction can possibly be secured. If patch tests are to be used prior to employment, it would be much better to test with a series of ten well known eczematizing agents to determine whether in general the prospective employee has an eczematous tendency. This procedure is of course impracticable in the vast majority of industrial plants. The presence or history of a contact eczema or ringworm is vastly more important than the performance of patch tests. Persons with such a history are more

5. Schwartz Louis: Dermatitis in Synthetic Dye Manufacturing, Pub. Health Bull. 218: 18-27 (Oct.) 1934.
6. O'Donovan, W. J.: Occupational Dermatitis, Brit. M. J. 2: 499-504 (Sept. 16) 1922.
7. Warren, J. T.: Lacquer Dermatitis or Dermatosis Industrialis (Papulovesicular Lacquer), Arch. Dermat. & Syph. 8: 77-78 (July) 1923.
8. McCord, C. P.: Occupational Dermatitis from Wood Turpentine, J. A. M. A. 86: 1979 (June 26) 1926.
9. Parkhurst, H. J.: Dermatosis Industrialis in Blue Print Worker Due to Chromium Compounds, Arch. Dermat. & Syph. 12: 253-256 (Aug.) 1925.
10. Goldman, Louis: Nickel Eczema, Arch. Dermat. & Syph. 28: 688-696 (Nov.) 1933.
11. White, R. P.: Some New Forms of Occupational Dermatoses, Lancet 1: 400 (Feb. 19) 1916.
12. Wedroff, N. S., and Dolgoff, A. P.: Ueber die spezifische Sensibilität der Haut einfachen Chemischen Stoffen gegenüber, Arch. f. Dermat. u. Syph. 171: 641-646, 1935.

liable to acquire other sensitivities than is a normal person, and they should not be employed in industries using substances with a high eczematizing index.

*Elimination of Unnecessary Hazards.*—Many compounds which have a high sensitizing index can be eliminated in favor of less harmful compounds. Certain oils,[12] accelerators used in the rubber industry,[14] paint solvents[8] and soaps and cleaners[15] vary in their tendency to produce sensitization. In order to eliminate the more harmful compounds of industry, it is necessary for the industrial dermatologist and the industrial chemist to cooperate, the former to discover specific causes of an outbreak of dermatitis and the latter to supply a different, less harmful compound which may be successfully used as a substitute.

Special care should be taken when new compounds are introduced in industry. At the first sign of an outbreak of dermatitis, steps should be taken immediately either to prevent contact or to eliminate the substance altogether. In many industries it is absolutely necessary to employ compounds capable of sensitizing a large percentage of the workers. The elimination of these hazards can be accomplished only gradually, by further chemical research. Until they can be removed from industry, the prevention of sensitization must depend on the elimination of intimate contacts between the eczematizing agent and the worker.

*Prevention of Exposure to Sensitizing Substances.*—There are numerous methods by which prevention of exposure may be accomplished. They have been successfully employed in many industries.

A. Use of closed methods of manufacture.[8] These methods are of value not only in preventing all forms of dermatitis but also in the prevention of systemic poisoning from the inhalation of dusts and gases.

B. Employment of suitable exhaust hoods to carry off gases, fumes and dusts at their point of origin. In the chromium plating industry,[8c] employment of exhaust hoods and closed methods of manufacture have almost entirely eliminated cutaneous reactions.

C. Proper general plant ventilation. This is necessary in addition to exhaust hoods to prevent contamination of the general atmosphere.

D. General plant cleanliness. Work benches, walls, floors and pipes should be cleaned frequently to prevent the accumulation of dangerous dusts. Some of our most severe cases of dermatitis have occurred in maintenance men, such as pipe fitters and electricians, who came in contact with dust which had been present for months and years.

E. Proper work clothing. Protective uniforms, including chemically resistant aprons and gloves, supplying the maximum degree of protection, should be issued to all workers handling substances with a high eczematizing index. The frequency of change should depend on the amount of contact in each individual case. These workers should have a complete change of clothing before leaving the plant, and the lockers containing their street clothing should be kept far enough removed from the general workroom so that no dusts can penetrate them.

F. Proper cleansing facilities. Shower baths and sinks should be made available to all workers to permit complete removal of any potential allergens from the skin. Proper cleansing agents should be supplied. Strong alkaline soaps, lye, turpentine, gasoline and various abrasive cleansing agents should not be used. One observer[16] has stated that he has seen more dermatitis due to the improper use of cleansing agents than to contacts in the occupation. We believe that this factor is extremely important in plants handling substances with a high sensitization index. Cleansing agents should be limited to olive oil, liquid petrolatum and nonirritating toilet soaps.

G. Instruction to workers regarding the danger of their occupation. An intelligent understanding on the part of the workers of the hazards to the skin connected with their work is extremely desirable. Downing[17] has stated that after a lecture the incidence of industrial dermatitis was reduced nearly 75 per cent in a particular plant. It is difficult for workers to understand the mechanism of sensitization. Educational efforts along this line should have a very beneficial effect.

*Early Recognition of Sensitization Dermatitis.*—One or two weeks of delay in the recognition of a sensitization dermatitis may mean the difference between a dermatitis lasting from two to four weeks and one requiring two or three years to subside. The appearance of a sensitization dermatitis in one worker should lead to closer observation of other workers handling the same substances. Any cutaneous eruption should be reported promptly to the medical department. The plant physician should determine at once whether he is dealing with a dermatitis due to a primary irritant or a dermatitis due to sensitization. If he is unable to decide, consultation should be requested. In our opinion, careful attention to these details would reduce the disability from sensitization dermatitis at least 50 per cent. If the eruption is a sensitization dermatitis, no matter how mild, the worker should be sent home and should remain there under treatment until the skin has completely healed. When he returns to work he should be assigned to another job, handling entirely different substances, with a low eczematizing index.

The question of first aid treatment of industrial dermatitis is extremely important. All too often ointments, lotions and sprays are applied which in themselves are highly eczematizing. We refer particularly to the widespread use of butesin picrate, ammoniated mercury, tannic acid sprays containing mercurials, and many other proprietary remedies found in some first aid rooms. Some of our most severe and distressing cases of industrial dermatitis have arisen from the injudicious use of these preparations. In our opinion, there is no necessity for the employment of any highly eczematizing substance in first aid work. Simple wet dressings, lotions and ointments are all that is indicated.

### OTHER OCCUPATIONAL DISEASES OF THE SKIN

Diseases of the pilosebaceous apparatus arising as a result of occupation, i. e. acneform eruption, comedones and furuncles, are commonly encountered in workers in oil,[18] paraffin,[18b] lubricating compounds,[18c] chlorine compounds,[3] sugar[19] or hypertonic salt solution.[18a]

13. Schwartz Louis: Dermatitis in the Manufacture of Linseed Oil, Pub. Health Bull. 218: 41-45 (Oct.) 1934. Tulipan, Louis: Dermatitis, Indust. Med. 5: 626 (Dec.) 1936.
14. Schwartz, Louis: Dermatitis in the Rubber Industry, Pub. Health Bull. 218: 1-10 (Oct.) 1934.
15. Jordon, J. W.; Walker, H. L., and Osborne, E. D.: Studies in the Eczematizing Properties of Soaps, New York State J. Med. 36: 791-795 (May 15) 1936.
16. Horner, S. G.: Some Observations on Industrial Dermatitis, Lancet 2: 233-236 (Aug. 4) 1934.
17. Downing, J. G.: Skin and Industry, Indust. Med. 1: 19-20 (Oct.) 1932.
18. (a) Downing, J. G., and Welch, C. E.: Industrial Dermatoses and Their Treatment: Review of Ten Years' Literature, New England J. Med. 209: 666-680 (March 31) 1933. (b) Schwartz, Louis: Dermatitis in Oil Refining Industry, Am. J. Pub. Health 24: 948-950 (Sept.) 1934. (c) McConnell, W. J.: Dermatosis Following the Use of Cutting Oils and Lubricating Compounds, Pub. Health Rep. 37: 1773-1794 (July 21) 1922.
19. Horner.[16] Downing and Welch.[18a]

McConnell [18c] found that 27 per cent of 557 workers whose occupation required exposure to cutting oils and lubricating compounds had oil acne. The condition is apparently due to simple mechanical blocking of the hair follicles with oil and foreign particles in the oil rather than to the presence of some infectious agent. The addition of antiseptics to oil or sterilization of oils by heat has not succeeded in cutting the incidence of this condition.[18c] Rosenberger [20] made bacteriologic studies of cutting oils and found staphylococci or streptococci only rarely a contaminant of either new or used oil. All who have studied this problem are in accord that cleanliness is of the greatest importance in the prevention of this common dermatosis. This consists in frequent washing of the exposed parts and frequent change of clothing. The use of lotions, powders and vegetable oils has proved of value in some instances. The use of protective pastes has proved of practical value.

*Occupational Keratoses and Cancer of the Skin.*—These conditions are common in workers in paraffin,[18b] pitch,[21] certain oils [22] and arsenic.[23] Keratoses usually precede the development of epithelioma. The Tworts [24] pointed out that certain oils are more carcinogenic than others. The highly hydrogenized oils are the least dangerous. Oils from certain parts of the world are more carcinogenic than others, and this apparently depends on the degree of hydrogenation. Mineral oils employed in the English textile plants are much more carcinogenic than the vegetable oils used in American textile plants. The Tworts pointed out that carcinogenic oils can be commercially treated to make them less dangerous. It is self evident that all workers handling carcinogenic agents should be frequently examined for keratoses and that if such growths are present they should be removed. Frequent and thorough cleansing of the skin and the use of protective ointments and pastes are indicated.

*Cutaneous Anthrax.*—Anthrax still remains an occupational hazard among the handlers of hides, hair and wool.[25] In the majority of cases the condition arises from the handling of infected hides imported from some country in which laws regarding the disposal of infected animals are not rigidly enforced. Since chemical disinfection of hides is unreliable [26] there is only one method of prevention of this severe disease, and that is the placing of an embargo on all hides imported from countries which do not have stringent laws regarding the proper disposal of animals dying from anthrax. Infection from American hides is rare because practically all states rigidly enforce the regulations.

### CONCLUSIONS

1. Industrial dermatoses to a large extent are preventable. To bring about prevention, scientific facts now available must be utilized.

2. Industrial dermatitis is the most common and important cutaneous hazard. There are two types: (*a*) dermatitis due to primary irritants and (*b*) sensitization dermatitis.

3. The prevention of dermatitis due to primary irritants depends on two factors: (*a*) mechanical means of protection and (*b*) education of the workers.

4. The prevention of sensitization dermatitis depends on (*a*) the proper selection of workers, (*b*) the elimination of unnecessary hazards, (*c*) the prevention of exposure to sensitizing substances and (*d*) the early recognition of sensitization dermatitis and its proper management.

5. The prevention of industrial diseases of the pilosebaceous apparatus consists essentially in personal cleanliness and the use of suitable protective measures.

6. Occupational keratoses and cancer of the skin may be prevented by (*a*) personal cleanliness, (*b*) the use of suitable protective measures, (*c*) the use of noncarcinogenic oils and (*d*) the prompt removal of keratoses.

7. The prevention of anthrax depends largely on the rigid enforcement of suitable sanitary regulations.

471 Delaware Avenue.

20. Rosenberger, R. C.: Bacteriological Study of Cutting Oils Causing Skin Lesions, New York M. J. 116:377-379 (Oct. 4) 1922.
21. Bridge, J. C.: Remarks on Occupational Dust, Brit. M. J. 2:1143-1147 (Dec. 21) 1929.
22. White,[b] Schwartz,[18b] Bridge.[b]
23. White,[b] Bridge.[b]
24. Twort, C. C., and Twort, J. M.: On Prevention of Mineral Oil and Tar Dermatitis Cancer, Lancet 1:286-287 (Feb. 10) 1934.
25. Smyth, H. F.: Anthrax, Indust. Med. 2:42-47 (July) 1933; Anthrax: Continuing and Probably Increasing Hazard of Industry, Am. J. Pub. Health 24:920-924 (Nov.) 1934.
26. Bridge, J. C.: Occupational Diseases of Skin, Brit. M. J. 2:324-327 (Aug. 19) 1933.

## ANALYSIS OF CLAIMS IN INDUSTRIAL DERMATOSES

JOHN GODWIN DOWNING, M.D.
BOSTON

An analysis of the component parts of claims for compensation for occupational dermatoses includes consideration of all problems related to the differential diagnosis as between the cutaneous disease arising from natural causes and that due to occupational hazards. This may necessitate considerable research in addition to a thorough physical examination, extensive clinical laboratory work, thorough investigation of the industrial exposures, and knowledge of the legislation of one's state as to dermatitis, the local insurance coverage, the mode of procedure of its deciding power and preceding decisions of commissions, medical boards or courts. A dermatologist should be cognizant of these subjects even if he does not care to do industrial work; in fairness to his patients he should be able to diagnose eruptions due to occupation and to advise his patients properly as to their further care and welfare. His training should enable him to diagnose eruptions arising from natural causes; as to occupational eruptions, Stauffer [1] demonstrated that it is possible to show the exact cause in nearly all cases, although in actual practice this result is not possible, for essential proof is often lacking. Experience in similar cases and study of the hazards, the mode of onset and the resulting physical signs will result in a decisive opinion in the large majority of cases, but there will remain a small group of cases in which the cause is undetermined and disputed and must be settled by an industrial accident board.

This analysis will be confined to the procedure in Massachusetts, where, as provided in the Workmen's Compensation Act, seven lay members comprise the Industrial Accident Board. It has been proposed that cases involving industrial dermatoses should be decided by medical men, but persons who favor this idea do not realize the large number of cases that are in fact

From the Department of Dermatology, Tufts College Medical School and the Boston City Hospital.
Read before the Section on Dermatology and Syphilology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 13, 1938.
1. Stauffer, Hans: Die Ekzemprobren, Arch. f. Dermat. u. Syph. 169:517 (Jan.) 1931.

judged by dermatologists. Dermatologists receive cases early and review them carefully. If the dermatologist concludes that the disease is nonoccupational, he explains this to the claimant, who in most instances is an honest worker and is relieved to know that his occupation is not to blame; if the dermatologist believes the disease to be occupational, he so informs the insurer, giving his reasons in full. The insurer rarely disputes the finding of a trained dermatologist, whether or not he selected him. The result is that hearings on occupational dermatoses are few in comparison with the number of cutaneous eruptions appearing in workers. In 845 of a series of 2,000 claims examined privately for insurers the dermatosis was considered nonoccupational; in 1,004 it was considered occupational, and in 151 it was not diagnosed. The diagnosis was contested in only 3 per cent of the cases. The dermatologist can always secure further medical assistance by consultation before rendering an opinion if he so desires, so that the medical aspects of the case may be assumed to have been thoroughly investigated. No one is better qualified to decide the diagnosis, the differential data and the etiologic factor than are dermatologists; when they disagree an impartial and duly qualified dermatologist is appointed to examine and report, and his report is considered admissible as evidence provided the employee and the insurer have been seasonably furnished with copies of it (General Laws, chapter 152, section 9). The employee who is unable to employ a dermatologist always has the right to an impartial examination. Payment is made by the board, although the law requires the insurer to reimburse it. The impartial dermatologist is usually given all the facts in the case, a summary of any hearings that have been held and all medical reports. Impartial physicians have been summoned to hearings of the Industrial Accident Board by either the plaintiff or the defendant, but to date the board has ruled that they should not be subjected to cross examination and has refused to allow them to testify. There has as yet been no court ruling on this decision.

On Oct. 14, 1935, the appointment of three physicians, to be known as industrial disease referees, whose final diagnosis is binding on both parties, prompted me to suggest the use of the term ergodermatosis [2] for the diagnosis of cutaneous eruptions arising out of and in the course of occupation (General Laws, chapter 152, section 9B). The diagnosis of these medical referees must be made on the physical signs present at the time of examination, although this diagnosis may be made months after the onset, perhaps when the patient has recovered. As a result, interesting complications are already developing.

With the etiologic factors decided and the diagnosis made, it may be asked why a lay board is needed. The answer is that the administrators of the compensation act need more than medical knowledge, for legal puzzles arise daily, the credibility of witnesses must be evaluated and working conditions and labor problems must be considered. With this in mind, the framers of the act wisely decided that the board should consist not of physicians or lawyers but of laymen; their decisions when reasonable and sensible are usually supported by the courts.

The Massachusetts Workmen's Compensation Act was designed for the protection of employees injured in occupation and to offset the advantages given to the employer under the common law, whereby the worker had to prove negligence on the part of his employer. It went into effect on July 1, 1912. One of the first questions to be settled was whether occupational diseases were covered by the act. It provides for compensation only for a personal injury arising out of and in the course of employment (*Minns Case*, 286 Mass. 459). It affords no remedy for disease, occupational or otherwise, contracted in the course of and arising out of employment. The construing of the words personal injury is left to the court. The court said in the Burn case (218 Mass. 8):

> "Injury," as applied to a personal injury to a human being, includes whatever lesion or change in any part of the system produces harm or pain or lessened facility of the natural use of any bodily activity or capability.

In the McNichol case (215 Mass. 497) the court said: [3]

> It is sufficient to say that an injury is received "in the course of" the employment when it comes while the workman is doing the duty which he is employed to perform. It "arises out of" the employment when there is apparent to the rational mind, upon consideration of all the circumstances, a causal connection between the conditions under which the work is required to be performed and the resulting injury. Under this test, if the injury can be seen to have followed as a natural incident of the work and to have been contemplated by a reasonable person familiar with the whole situation as a result of the exposure occasioned by the nature of the employment, then it arises "out of" the employment.

In other words, this is a rational law, to be administered by reasonable persons in a practicable manner for practical people, and has been so executed by the Industrial Accident Board. The compensation payments are made promptly, and when disputes arise hearings are assigned quickly and decisions are made without delay. While mistakes occasionally occur, they are few when one realizes the responsibility and magnitude of the board's task. Every day presents new problems and questions, as shown by the following cases:

Case 1.—*G. P. M.* v. *T. Mfg. Co.* Hearing Oct. 19, 1931. The patient worked three and one-half years as an electroplater, coming in contact with potassium cyanide. An eruption appeared on his hands three months after he started to work and remained until he stopped work because of his dermatitis, loss of weight and weakness. Two physicians called by him testified that he had been disabled as a result of his employment. Two physicians called by the insurer believed that his work had nothing to do with his disability, having seen him after his cutaneous condition had disappeared. The impartial dermatologist reported that the cutaneous condition was due to the cyanide used in work. The board member's decision, based on the impartial opinion, stated that, as the medical testimony at the hearing was neither decisively for nor decisively against the contention of the employee, he had sustained an injury arising out of and in the course of his employment, with resulting total disability. With contradicting medical testimony, the commissioner is apt to base part of his decision on the impartial report, especially if there has been exposure to irritants. In this case the insurer introduced the foreman of the plating department, who testified that the employee had had very little contact with the silver solution and chemicals used in the work. However, the employee testified very clearly that he used potassium cyanide every day that he worked. The member said, "I believe that the employee himself was in the best position to know the extent of his exposure, and I accept his testimony on that point."

2. White, R. Prosser: The Dermatergoses, ed. 3, London, H. K. Lewis & Co., Ltd., 1928.

3. Grandfield, Robert E.: Workmen's Compensation Administration in Massachusetts, the Annals 128:61-74 (March) 1928.

The board does not, however, always accept the employee's opinion when there is sufficient evidence against the presence of irritants in the employment:

Case 2.—*E. B. N.* v. *T. Spa.* Hearing Aug. 23, 1930. The patient, a counter girl and waitress, claimed that she had an eruption on the fingers of both hands as the result of constant wetting of her hands for eight hours daily. Her own physician, a dermatologist called by the insurer and the impartial examiner diagnosed her condition as epidermophytosis. Her employer at the hearing showed that there was no necessity for any constant wetting of the hands, her work being of a clean, dry type. The member decided on careful examination of the evidence that the employee had failed to prove that her incapacity was the result of her work.

A fungous infection of the skin is considered a disease, and not caused by industrial contacts, and if there is no evidence of irritants in the work which would aggravate this disease, the patient has little support for his contention that such were present:

Case 3.—*I. B.* v. *J. N. Co.* Hearing March 3, 1930. The patient stated that she had worked for five and one-half years as a salesgirl, selling art goods, yard goods and hardware, and that as a result of the occupation she suffered an eruption on her hands. The diagnosis by her own physician and by a dermatologist was epidermophytosis. The claim for compensation was dismissed because her eruption was considered nonoccupational and because there was no satisfactory evidence that it was aggravated by her work.

While a fungous infection of the skin is considered a disease rather than an injury, when working conditions are such that they might aggravate the disease the board recognizes this fact in its decision:

Case 4.—*C. C.* v. *G. E. Co.* Hearing Nov. 21, 1930. The claimant, a wet grinder, stated that water leaked out of his machine, causing his feet to become saturated with a solution containing 11 pounds (5 Kg.) of soda to 50 gallons (200 liters) of water. He worked under these conditions until he suffered such a severe pain in one foot that it was necessary for him to stop work. The plant physician diagnosed his condition as epidermophytosis, not occupational, but on cross examination admitted that a wet stocking might have irritated the eruption on his foot. His own physician stated that he had a dermatitis due to an alkali. In this case the member decided that the employee had received an injury arising out of and in the course of his employment. The insurer filed a claim for review of the decision, and a reviewing board of three members affirmed it.

The mere fact that a patient is compensated for an eruption occurring during employment does not necessarily mean that he will be compensated for later eruptions if testimony shows that he does not come in contact in his work with irritants which could cause or aggravate a dermatitis:

Case 5.—*M. D.* v. *H. R. Co.* Hearing May 1, 1933. On Aug. 16, 1929, the patient became disabled from a fungous infection which she thought was aggravated by contact with naphtha at her work. The insurer denied that the condition was caused or aggravated by her work but agreed in the absence of a specific diagnosis to pay the employee against her further rights and accordingly paid compensation from Aug. 16 to Dec. 6, 1929. The patient then returned to her work of lacing shoes, at which time the eruption had not entirely cleared. The diagnosis of the plant physician and two dermatologists was epidermophytosis. The impartial report, which was not read at the hearing, must have disagreed with this, for the defendant's lawyer summoned the impartial physician, his reason being that this physician's opinion was based entirely on the history given by the employee, which the insurer alleged to be false. The member ruled that the impartial examiner should not have been forced to appear and therefore did not allow him to be cross examined. From the history of the work and from medical testimony the member decided that the patient had failed to prove that any disability from which she suffered from Feb. 15, 1932, was related to the injury which she sustained on Aug. 16, 1929, and her claim for compensation was dismissed.

Medical bills are handled by a majority of the board as a whole. The evidence is taken by a single member, but he does not make the decision alone:

Case 6.—*R. C. T.* v. *W. G. F. Shop.* Hearing Sept. 8, 1930. The claimant, a florist, suffered an eruption on his hands from contact with plants; his statement was confirmed by his own physician, the hospital clinic and a dermatologist, and he was awarded compensation. His medical bills were protested as excessive, but four members decided that he had a stubborn outbreak of dermatitis which required the services of a specialist. The board found that this case came within the meaning of General Laws, chapter 152, section 30, according to which the board may in its discretion approve the payment of services beyond the first two weeks and approve for payment by the insurer the bills of the dermatologist and also of the general practitioner.

A patient with impetigo contagiosa may require considerable proof before he is satisfied that his condition is not occupational:

Case 7.—*J. R.* v. *W. F. Sons Co.* Hearing Feb. 4, 1935. The patient claimed to be disabled as the result of acquiring impetigo from handling fur coats. The only evidence was that of a dermatologist, who stated that the patient had impetigo contagiosa, which was not in his opinion occupational. The member agreed with this opinion. The plaintiff appealed to a reviewing board, which also dismissed the claim.

The board is fairly well agreed that certain diseases of the skin are not compensable. However, every now and then a member surprises every one by awarding compensation to a claimant who is suffering from a recognized nonoccupational cutaneous eruption:

Case 8.—*F. J. McN.* v. *A. Prod. Co.* Hearing June 4, 1934. The claimant, a molder, claimed that the cause of his cutaneous eruption was the excessive heat and dust with which he came in contact while making bakelite fittings. His physician diagnosed his eruption as "erythematosis" due to the excessive heat and dust. Two dermatologists agreed that it was psoriasis; one stated that it was in no way related to his work, and the other stated that in his opinion it was not occupational but that he could not say that the work did not cause it. With this in mind and with the knowledge that bakelite workers are subject to cutaneous eruptions, the member awarded compensation to the claimant and ordered the insurer to pay reasonable bills, which, as one would expect, were rather large. In this case there was no evidence of any industrial dermatitis, despite the fact that the type of work may produce an eruption. Here is a case in which a man, although engaged in an occupation hazardous to the skin, presented an eruption which was known many years before the discovery of bakelite and which certainly belongs in the nonoccupational class.

If there is a history of injury outside of employment, compensation is apt to be refused although the patient is exposed to possible sources of infection:

Case 9.—*G. W.* v. *W. H. S.* Hearing Dec. 9, 1921. The claimant, an undertaker's assistant, suffered a severe infection of his face, with resulting osteomyelitis of the jaw, which, he stated, was due to an infection acquired at his work. The claimant said that he believed that the infection started soon after he cut his chin with a razor while shaving. Although he contended that the infection was acquired in the course of his work, which brought him in contact with diseased bodies, it was found that he had not proved that the infection and the incapacity caused thereby were related to an injury arising out of and in the course of this employment. His claim for compensation was dismissed.

However, if a patient definitely shows that he suffered an injury at his work and then acquired an infection, compensation is generally awarded:

CASE 10.—*T. N.* v. *H. R. Co.* Hearing May 17, 1932. The patient, engaged as a cementer of rubber soles, while doing this work suffered an eruption on his left thumb. He was treated at the plant clinic, where a diagnosis was made first of eczema and then of ringworm. He then suffered a severe infection of his thumb, with resulting septicemia. At the hearing the plant physician maintained that the irritants which were previously present in the rubber cement, namely hexamethylenetetramine (called "hexa") and dinitrophenyl dimethyl dithiocarbonate (called "safex") had been removed and that the cement was no longer a hazard to the skin. He stated that he believed that the man's disability resulted from a fungous infection and was not related to his work. A dermatologist who appeared for the employee testified that he had had a felon of his thumb, with resulting septicemia, and not an industrial dermatitis. Another dermatologist called by the employee testified that in his opinion the disability arose primarily from a dermatitis of the thumb caused by the cement, which later became secondarily septic, and that the injury therefore originated from his work. The member, in summarizing his decision, based it on the fact that the man was treated for a long time at the employer's clinic, where a diagnosis of eczema was made and was later changed to one of ringworm. He felt that a fair preponderance of the evidence showed that the patient had suffered a disability brought about by his work. He therefore awarded him compensation for a period of thirty-eight weeks.

If a claimant reports an injury at his work and it later becomes septic, he will receive compensation:

CASE 11.—*A. N.* v. *P. S. Co.* Hearing June 8, 1921. The patient, a heel liner, stated that a tack became stuck in the back of her right hand; the wound became infected, with the result that she suffered a severe infection of her hand and arm. This was confirmed by her own physician, and she was compensated for a period of two and one-half months.

When sepsis complicates a dermatitis, the insurer is apt to regard this condition as nonoccupational, although the same insurer will without complaint pay a claimant suffering from sepsis following a wound:

CASE 12.—*F. C.* v. *W. W. T.* Hearing Feb. 24, 1933. The claimant, employed as a cook and dishwasher, suffered a dermatitis of his hands, but he continued to work, and while doing so it was necessary for him to clean fish and open lobsters. A septic condition then developed, with lymphangitis, which necessitated his stopping work. His own physician stated that he had no definite opinion as to the cause of the condition. His employer admitted that the man suffered from burns on his hands from hot grease, cuts on his palms from handling lobsters and an eruption from contact with soap powders. The impartial examiner stated that he believed that the infection started from dermatitis venenata. The member found that the employee was disabled as a result of an injury arising out of and in the course of his employment and awarded him compensation for five months' disability.

At times it is difficult to decide which insurer is liable for compensation:

CASE 13.—*T. C.* v. *A-L T. Co.* Hearing Jan. 29, 1931. The claimant, a seasoner of leather, suffered a dermatitis while working for a tanning company. The eruption appeared on both hands and forearms. He stopped work May 2, 1930, and was compensated to May 21, at which time he signed an agreement of discontinuance but testified that he still had an eruption on his hands. The presence of an eruption was confirmed by his physician. In July he went to work for another leather company but stopped at the end of a week and a half because of a dermatitis of his hands. As his hands were not well at the time of this last employment, the commissioner found the insurer of the first company liable for payment of his compensation, which was granted from May 25 to Sept. 29, 1930, except for the week and a half that he worked. The outbreak from work at a second factory was considered a recurrence of his former condition and not a new injury. This man was advised not to return to his previous trade and was granted partial compensation. He was advised to accept work at a lower wage, and the partial award was made to compensate him for the diminution in earning capacity. The insurer appealed the case, but a reviewing board affirmed the member's decision.

When a man is disabled from contact with irritants and his eruption is relieved, he is generally advised not to return to his previous occupation. If he neglects this advice, he is apt to be refused compensation:

CASE 14.—*J. K.* v. *M. S. Co.* Hearing Oct. 29, 1930. The claimant, an assembler of shoes, suffered a dermatitis due to handling a new paste on an assembling machine, for which he received compensation. His case was assigned for a hearing at the request of the insurer in order to determine the amount of disability, if any. According to the insurer's physician, the man's dermatitis was relieved. It had been shown that he was very sensitive to the paste, and he was aware of this fact, for it had caused a recurrence of his eruption on the slightest contact. However, four days before the appointed hearing he returned to his old employment, came in contact with the same paste and suffered a prompt outbreak of his dermatitis. Just before returning to work he had been seen by an impartial physician, who stated that his hands were perfectly normal and advised him not to return to contact with the paste. The member decided that the claimant had recovered entirely, that he had been warned by his physician not to return to his former work or to expose himself to the paste which had caused his trouble, and that his doing so was a "voluntary act on his part," which broke the line of causation between his original injury, arising out of and in the course of his employment. The insurer was authorized to discontinue compensation.

When a patient receives treatment for an industrial injury and then suffers any subsequent incapacity as a result of this treatment, he is eligible for compensation:

CASE 15.—*J. G.* v. *C. S.* Hearing April 20, 1927. The claimant, while digging in a trench, dropped a pick into some electrical equipment in a cement box and received an electrical shock. The accident left him in an extremely frightened state of mind, with the result that a neurologist prescribed bromides in fairly large quantity. Later he suffered an outbreak on his lower legs. The report of the impartial examiner stated that the claimant was suffering from an eruption on his lower legs due to bromides. He was awarded compensation for a period of nineteen weeks.

Treers, men who clean, dress and iron shoes, are well paid but as a rule are not employed steadily. They are apt to suffer a dermatitis while employed at one company and to work until there is a lay-off; they then claim disability, return to work before they are entirely relieved and have another outbreak. The insurers try to dispose of the cases by payment of a lump sum, but this does not prevent a worker from collecting from another insurer for an eruption acquired at a different place of occupation:

CASE 16.—*M. M.* v. *H. S. Mfg. Co.* Hearing Aug. 8, 1932. The claimant, a shoe treer, worked for the P. Shoe Company and suffered a dermatitis, for which he was compensated for six months by the Z. Insurance Company. He went to work for the F. Shoe Company, suffered a dermatitis and was paid compensation by the G. Insurance Company. He then went to work for the D. Shoe Company and was paid compensation by the A. M. Insurance Company in a lump sum. He then went to work for the H. Company and had another outbreak. He stated that each time he returned to work his skin was well. In this case there was no evidence brought out that any one had forbidden him to return to his trade, so that the point referred to in the previous case does not always hold true. The member found that the man was totally disabled as a result of his last attempt to work and awarded him full compensation. (It is

my belief that the previous attacks were paid for because the man suffered on each occasion a dermatitis of short duration and the insurance company found it cheaper to pay his compensation than to bring the case to a hearing. There is no evidence of any hearings except this one.)

If a man suffers a dermatitis which finally clears, he is inclined to attribute all subsequent conditions to it:

Case 17.—*J. K.* v. *B. Shoe Co.* Hearing April 24, 1931. The patient, a treer, suffered a dermatitis for which he received compensation until his eruption had disappeared. Later he complained of a tremor of the hands, which he attributed to his previous condition, claiming further compensation. His own physician testified that the tremor was the result of his dermatitis. A dermatologist was of the opinion that there was no relationship, and every one at the hearing was able to note the increase of the tremor each time attention was called to the patient. This fact was evidently noted by the member, for he dismissed the claim.

It is at times very difficult to decide whether or not an employee is disabled; a condition with which a man has been able to work suddenly becomes very disabling when there is a lay-off:

Case 18.—*N. S.* v. *P. Shoe Mfg. Co.* Hearing Dec. 2, 1935. The patient, a treer, claimed disability as the result of a dermatitis on one finger. While a treer may have some difficulty in working with an eruption on one finger, he is not totally disabled. The claimant stated that his right second finger became irritated from cleaning shoes. He continued to work, however, until he suffered in addition a dermatitis on the right thumb. He then stopped work. It was agreed that he had an occupational dermatitis and he was advised to return to work. He did so and worked until he again had an eruption on his fingers. At that time there was a lay-off. His physician testified that his eruption was relieved and that he advised him not to return to the work of dressing shoes because of susceptibility. The impartial examiner agreed with this opinion. The member granted him compensation but recommended that he wear a finger cot and make a further effort to do his work. He was granted fifteen weeks' compensation up to the date of the hearing. This was paid by the insurer without protest, but a full board was required to decide that the treatment given him by his physician was necessary.

In other cases the employee may be refused compensation and the physician be paid without protest:

Case 19.—*A. C.* v. *T. G. P. Corp.* Hearing Nov. 17, 1931. The patient suffered a dermatitis while working for the P. Shoe Company as a shoe cutter but was able to work until the firm finally went out of business. He did not report his injury. In the meantime his dermatitis quieted down. He went to work for the C. Shoe Company doing the same work and was employed there for about six months, until there was a lay-off. Medical testimony agreed that he had an industrial dermatitis. However, the claim was made against the insurer of the P. Company, and the member decided that the patient's incapacity, if any, was due to exposure at the time he was employed by the C. Shoe Company. Since there was no claim made against the insurer of this company, the member made no finding as to the payment of compensation. A second hearing was held on June 14, 1932, against the insurer of the C. Shoe Company. The medical experts were then confronted with the problem of deciding whether the dermatitis was a result of the injury sustained at the P. Shoe Company or whether there was an intervening lapse of relief, with an acute exacerbation from the patient's second employment. A dermatologist called by the employee testified that it was a new injury and disabling. A dermatologist called by the insurer stated that at no time had the man suffered from a disabling dermatitis. Both recommended treatment. It was ruled that if the employee did have a dermatitis his present condition was a new injury but that there was no incapacity for work as a result of this injury and therefore he was not entitled to any compensation. The recommendation was made, however, that he be treated. The man returned to work and continued at it for five years without any disturbance. In 1937 he came in contact with white buckskin, which out of twenty leathers was the only one to which he was sensitive, and suffered a dermatitis which disabled him for several weeks.

The onset of an industrial dermatitis frequently becomes a debatable point. While it is usually recognized that the date of the injury is the time when disability begins, occasionally when a new insurer takes over a risk and the employee then becomes disabled, the compensation may be divided between the two insurance companies:

Case 20.—*J. H.* v. *J. G.* Hearing April 18, 1929. The claimant, a lithographer, suffered a dermatitis from contact with inks, oils, kerosene, turpentine and chromic acid, which started in June 1928, but he did not stop work until November 1928. During all this time the eruption persisted, growing progressively worse, until he was totally incapacitated on November 17. On November 1 a new insurance company took over the risk, so that the commissioner found that the two companies were jointly liable. This decision was affirmed by a reviewing board. This finding will probably not be made again because of the supreme court decision in the Donahue case in 1935 (290 Mass. 239), in which the board found that the pneumoconiosis in question was due to accumulative exposure over a long period, but that the insurer who covered the risk at the time the disability occurred was liable. The insurer appealed to the court on the ground that one or more of the previous insurers should contribute. The court said "It is significant, however, that none of our decisions give any support to the suggestion that several insurers can be held jointly. We think the implication from the statutes and from all the cases taken together is so strongly against the appellant that the question cannot fairly be said to be still open."

A point which is frequently brought in is susceptibility. The decision in 286 Mass. 541 (1934) is authority for the statement that when the original eruption had cleared up but the "skin had never returned to normal" there was "disability as to the particular employment (involving exposure) but not as to employment in general" and "it was the duty of the employee to try to get other work":

Case 21.—*R. C.* v. *D. Mfg. Co.* Hearing Jan. 5, 1933. The claimant, a machine worker, came in contact with various dyes. Medical testimony agreed that he had suffered a dermatitis. The patient worked with the dermatitis until he was laid off; his eruption then disappeared. Since then he had not worked because he did not dare to come in contact with irritants. A dermatologist called by the employee admitted that the dermatitis had cleared up but said that he should not resume any work which would bring him in contact with chemicals. Although this situation was admitted, the member ruled that mere susceptibility did not constitute disability. This opinion was supported by a reviewing board. At a previous hearing this man had been awarded total compensation from April to September 1931 and partial compensation to Dec. 16, 1931.

Case 22.—*M. D.* v. *R. Preserving Co.* Hearing May 23, 1928. Removing stones from dates can cause a dermatitis, as testified by two dermatologists in this case. This decision was confirmed not by patch testing but by the evidence that each time the claimant returned to this work she suffered a new outbreak, although she could do other types of preserving without infection.

Bakers' eczema is very persistent and is apt to recur. Some employees are so anxious to return to work that they are willing to sign away their rights in order to secure employment:

Case 23.—*R. N.* v. *R. G. S. Co.* Hearing June 29, 1933. The claimant, a baker, suffered a dermatitis while employed and received compensation. He then requested work at his place

of employment and signed the following statement: "I, R. N., will not hold the R. G. S. Co. responsible for disability resulting from any condition to my skin through my occupation as baker with them." It was agreed that this man had bakers' eczema, and while the insurer told the employer not to employ him there was no medical testimony forbidding him to return to the work. Despite the signed statement, the member ruled that this had no legal effect on the employee, since it was not a waiver within the terms of the statute, and that when the employee was compelled to stop work on account of his dermatitis he sustained a recurrence and was therefore entitled to compensation. This decision was confirmed by a reviewing board.

If a claimant presents proof that he has been told that he can return to his former occupation, the supreme court decision forbidding such an act does not apply:

CASE 24.—*W. T.* v. *80 F. Street Restaurant.* Hearing June 11, 1934. The claimant, a baker, did ordinary hand mixing and suffered various outbreaks on his hands from 1929 to 1934 because of his occupation. In 1932 he had received a lump sum settlement for a similar dermatitis due to this work. At that time a dermatologist who treated him told him that he could return to his work. There was no question as to his dermatitis or disability, but the question of its being a recurrence of the condition from which he had suffered in 1929 was raised by the insurance company. However, he stated that when he went to work in 1933 for the company involved his hands were perfectly well and that he worked for six months without trouble. Because of his testimony, in which he stated that he had been told that he could return to his work, it appeared that he was justified in thinking that it was all right for him to do so. He was therefore awarded compensation.

The presence of active lesions of syphilis does not bar an employee from compensation if there is evidence of an industrial dermatitis:

CASE 25.—— v. *K. J. Q.* Hearing June 29, 1931. The report of the impartial examiner stated that the claimant had an industrial dermatitis on his hands and forearms but that there were active lesions of syphilis, which were confirmed by serologic tests. The syphilis was not in any way related to his occupation. He was awarded compensation for his industrial dermatitis, irrespective of his constitutional disease.

When an employee is housed as part of his employment he is apt to make a claim for eruptions following exposure to parasites:

CASE 26.—*W. O.* v. *O. H. Inc.* Hearing Dec. 4, 1926. The patient testified that as part of his employment he was compelled to sleep in a bed furnished by his employer and that shortly afterward he suffered from itching all over his body. A diagnosis of scabies was made by a dermatologist. The claimant gave no proof that others were so affected, and the member dismissed his claim.

A claim for compensation is supposed to be made within six months of the injury. However, the late filing of a claim does not prevent the payment of compensation if the member decides that the insurer was not prejudiced. If the employer has knowledge of the injury at or reasonably soon after the happening thereof, tardiness in filing a claim is excused. The same is true if the tardiness does not prejudice the insurer's right to investigate or treat the condition. No element of fault on the part of the employer seems to be involved. *Crowley Case*, 287 Mass. 367 (1934), and *Hatch Case*, 290 Mass. 259 (1935).

CASE 27.—*F. Q.* v. *D-G Kid Mfg. Co.* Hearing June 1, 1931. The claimant suffered a dermatitis on Oct. 22, 1929, but did not file a claim for compensation until June 1, 1931. His work consisted of stacking leather, and he came in contact with wet skins, recently tanned. His physician testified as to his having an occupational dermatitis. When he was questioned as to why he did not file a claim sooner, he testified that he had expected some one to tell him about it. However, on Nov. 23, 1929, he notified his employer that he could not work because of his condition. He was awarded compensation, provided the member found that the late filing of the claim had not prejudiced the rights of the insurer. The claimant was compensated from Oct. 23 to Dec. 9, 1929. It is interesting to note that the man returned to the same work and apparently had no recurrence.

Another example of late filing of a claim is one that occurs when the employee is uncertain as to what work caused his final disability:

CASE 28.—*T. C.* v. *W. Co.* Hearing Feb. 9, 1923. The patient filed claims for compensation against three different companies. It was brought out that he first had trouble with his hands on Dec. 30, 1920, while working for the W. Company, where he was employed for five days. He continued to work for this company, doing various jobs, and continued to have a dermatitis. A strike threw him out of work from January until May 20, 1921, and during that time his dermatitis was relieved. In August 1922 he went to work for the N. W. Company, which was insured by a different company, and again suffered a dermatitis of his hands, which persisted. He then went to work for J. H. D., who was insured by a third company. At that time he still had a dermatitis of his hands, which increased at his work, so that finally he had to stop work on Dec. 8, 1922. At that time he went to a local hospital, where he learned for the first time that his trouble was due to his work. He then filed claim for compensation against the three companies. He was seen by two dermatologists, who agreed that he had an industrial dermatitis. From the evidence in this case the member found that the employee while in the employ of the W. Company had received a personal injury which consisted of an eruption on his hands caused by contact with cement, that this dermatitis disabled him from Dec. 8, 1922, to the time of the hearing and that he was still totally incapacitated. The member decided that the man did not definitely know until Dec. 20, 1922, that his injury was caused by cement and therefore had a reasonable cause for not filing a claim for compensation before this time. It was found that the employee filed his claim within a reasonable time after he had learned the cause of his injury.

These cases show that medical knowledge, while of value, is not essential, for it may be entirely disregarded. The board member learns to evaluate both the opinions and the physicians expressing them and to accept or reject the opinions accordingly.

The word of a qualified dermatologist has considerable weight with the board, but how are the members to judge the qualifications of the newcomers appearing before them? A list of "diplomates" certified by the national examining boards would solve this difficulty, for certification would at least establish that the physician was able to distinguish eruptions arising from natural causes from those coming from occupation. There would be less attribution of cutaneous diseases of unknown origin to industry, especially those recognized long before the industry in question came into existence. The same care should be exercised in establishing the diagnosis of an occupational disease that is used with nonoccupational ones; and, apart from the contagious group of the latter, the former are of greater importance, for more people than the worker himself are affected. The exposures must be studied and the differentiation must be made between a hazard, carelessness and an idiosyncrasy. What might be a hazard to one worker is not necessarily one to a group, so why change a whole process when the employee can be put on other work? In one case I made an inspection of a plant with another physician, who decided

that twenty skilled mechanics should be laid off because of a persistent dermatitis of the fingers. This lay-off meant the shutting down of the plant, with hardship to over 200 employees. On my advice it was decided to keep these twenty men at work. They continued to work without difficulty, and some were relieved without change of occupation. When a dermatitis occurs regularly in a given occupation and presents characteristic signs, undoubtedly it is occupational. Not every outbreak of eruptions in a plant, however, is necessarily occupational, any more than is an outbreak of impetigo in a classroom, and a careful inspection of the plant and employees will reassure both the employer and the workers.

In the case of occupational dermatoses the irritants should be pointed out and modified or eliminated, or else protective measures should be installed. If the disease is nonoccupational, this should be explained to the employee, who should then be referred to his physician. If his condition is contagious he should be sent home until relieved. Nothing hurts the morale of a plant more than the suspicion of a hidden hazard, and the dermatologist, when called, should be familiar not only with the poisons which cause local cutaneous disturbances but also with those which have systemic effects, for the skin may be the alarm which warns of an unsuspected poison. Nevertheless, the importance of occupational dermatoses must not be exaggerated by elaborate figures. Dermatitis venenata in ordinary life, while it may present an occasional serious eruption, is not viewed with alarm. The patient when told this is reassured and either carries on his activities or resumes them after a short period without ill effects. The same is true of the majority of occupational eruptions. The serious ones are those which show that there has developed a sensitivity to a certain trade chemical which means the loss of the occupation and those in which there is present a poison which causes severe systemic disease, such as benzene poisoning, which may not be recognized until hemorrhagic lesions have appeared. Germ diseases, with the exception of anthrax and the occasional primary fungous infections, are few. While dermatitis is the chief cause of compensation claims in most states, careful study of these claims rules out many of them.

In New York in 1936, of 1,036 claims, 684 (66 per cent) were for dermatitis, of which 299 (29 per cent) were allowed. Occupational dermatoses are so apparent that means for their prevention can be more easily adopted than is the case with any other group of occupational diseases, and if the dermatologist has the necessary training and interest and is cooperative, industry will naturally turn to him in its problems. With the recent inclusion of occupational dermatoses in the compensation laws of some states, the dermatologist has assumed a new function in appearing before industrial commissions; he should be extremely careful as to his opinions and testimony and should not allow himself to be called in merely to cast doubt in a particular case. He should exercise the greatest care in the examination and study of each claimant before expressing an opinion, so that he may be able to support his diagnosis against clever legal cross examination. If, however, there are presented at the hearing new facts which prevent him from conscientiously adhering to his previously expressed opinion, he should admit his error. Otherwise expert dermatologists will have their opinions cast aside, as in some of the cases reported, and will soon be discredited, with the resultant appointment of state medical officers in their place. This is especially likely to occur if the costs of compensation enlarge until industry can no longer pay them and the state assumes the burden.

520 Commonwealth Avenue.

---

## THE COMPENSATION LAWS AND RELATED MEDICOLEGAL CONSIDERATIONS

HARRY R. FOERSTER, M.D.
MILWAUKEE

Industrial or occupational dermatoses have received recognition as distinctive and important diseases of the skin not alone on account of outstanding clinical characteristics, but because, together with other industrial diseases, they constitute a unique sociologic group. They represent a new alinement in medical practice and are of increasing importance because of their economic and political implications in the social class in which they predominate. Industrial dermatoses are particularly important because of the legal provisions that have been enacted in connection with them. In the development of these laws physicians are beginning to participate and should therefore be familiar with their interpretation and application, especially since such laws have become a major legislative consideration in many states and may become a federal issue. In 1937 bills on some phase of occupational disease were introduced in twenty-three state legislatures.

### MEDICAL PROVISIONS

Secretary of Labor Perkins once stated (1932) that the medical aspects of the workmen's compensation laws were on the whole among the minor problems of such laws and that the chief concern and duty of the persons charged with enforcing and carrying out these laws were to see that the injured workmen received proper and adequate medical care.[1] If this implies that the compensation laws are to be so liberally interpreted that medical care is the prime requisite to be provided regardless of consideration of liability or without a strict determination of the question of liability, with the employer, the insurance carrier or the state compelled to furnish such service, there will be socialized medicine, not industrial medicine. Conversely, if medical service and compensation legally provided for a workman and applicable in his case are denied him because of some dereliction on the part of the physician, the latter is not fulfilling the social obligation with which the law clothes him. Where liberal compensation laws prevail, the medical aspects are decidedly not minor problems, because their interpretation is increasingly difficult and a rigid interpretation of the medical provisions under such conditions is as much in the interest of the workman with an occupational disease as in the interest of the employer. Laxness or incompetence in medical cooperation, especially within the scope of liberal laws, will build up a tremendous economic burden for industry and can bankrupt certain

Read before the Section on Dermatology and Syphilology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

1. Development in Workmen's Compensation Since 1930, Bureau of Medical Economics, J. A. M. A. 110:121B (Feb. 26) 1938.

industries and insurance companies and throw men out of employment. The threat of this has actually occurred as the result of the silicosis problem.

An example of the effect of liberalizing the laws may be presented from Wisconsin, which has a very capable industrial commission. As contrasted with 1920, there were in 1934 three times as many compensable cases in Wisconsin, with more than six times the expenditure for indemnity and ten times the expenditure for medical aid. In Ohio, where the laws are clearly defined and limited by schedules and where medical supervision is efficiently organized by the state department of health, there were 13,000 cases of compensable occupational disease reported in the ten year period from 1928 to 1937 inclusive, of which 67.5 per cent were cases of occupational dermatitis.[2] In the eight years before Ohio compensated for occupational disease (1921) there was a yearly average of 322 compensation cases; since then this average has been 1,144, or approximately four times as great.[3] The manager of the conservation department of the National Bureau of Casualty and Surety Underwriters has been quoted as stating "It is no exaggeration to say that the financial life of some of our most important industries is at stake and serious effects will occur if measures are not taken to remedy the conditions causing occupational diseases."[4] In metropolitan New York in 1936, 385 of 684 dermatitis claims, or 77 per cent, were denied by the state commission after review.[5] Consider the economic possibilties under poorly devised "all coverage" provisions, lax law enforcement or incompetent medical supervision or service.

The workmen's compensation acts, the basis of much medicolegal controversy, have unquestionably shown a steady development toward the liberal or progressive side and a striking evolution toward national uniformity, frequently arrived at by political guidance rather than based on local and economic needs. Beginning with the Wisconsin act of 1911, providing compensation and medical care only for accidental injuries acquired in employment, compensation acts are now on the statute books of every state but two, and in twenty-eight states and five federal jurisdictions, in addition to accident provisions they now authorize compensation and medical care for occupationally acquired disease.[5]

## DEFINITIONS OF INJURY AND DISEASE

To the conservative minded, the joker in the compensation laws appears to be the definition of a compensable injury. Much liberalization of the law has been accomplished by the simple expedient of changing coverage from "accidental" injury to "personal" injury and by liberally defining the latter. In the California compensation act the term injury "includes any injury or disease arising out of employment"; in Wisconsin statutes injury is "mental or physical harm to any employee caused by accident or disease"; in the United States employees' compensation act the term injury includes, "in addition to injury by accident, any disease proximately caused by the employment"; in Delaware injury or personal injury is construed to mean "violence to the physical structure of the body," while in Connecticut injury or personal injury "shall be construed to include only accidental injury which may be definitely located as to the time when and the place where the accident occurred."[5] The supreme court of Massachusetts, in reviewing a specific case, interpreted personal injury as "including any lesion or change in the human system which causes pain or incapacity for work."[6] Either the court is too liberal in its interpretation of personal injury or that term should be excluded from the provisions of compensation laws, for the social philosophy of such provisions is paternalistic, uneconomical, unpractical and undemocratic.

There appear to be thirty states that provide compensation for some form of dermatosis. Ten states (Alabama, Arizona, Georgia, New Mexico, Maine, Maryland, Tennessee, Texas, Vermont and Wyoming) rigidly confine compensation to cases of accidental injury or personal injury due to accident in line of employment and exclude all dermatoses; eleven states (Colorado, Florida, Idaho, Iowa, Kansas, Kentucky, Nevada, Montana, Oregon, Virginia and West Virginia) recognize dermatoses only when they can be interpreted as accidental injuries, and four states (California, Massachusetts, North Dakota and Wisconsin) permit interpretation of occupational dermatoses as personal injuries and liberally define the latter. Connecticut law states that a "personal injury shall not be deemed to arise out of the employment unless causally traceable to the employment rather than through weakened resistance or lowered vitality."[7]

The clearly defined conception of a compensable injury as stated in the Connecticut law, and the restrictions placed on provisions for compensation because of occupational injury in other states referred to, appear to provide adequate protection to the workman with a legitimate claim because of an occupationally acquired injury, and at the same time they give some protection to those individuals and groups who are held legally responsible to provide compensation for such injuries. With regard to dermatoses coming under injury clauses, there is need for detailed definition. In some states it is still legally possible to obtain compensation for conditions such as lichen planus, psoriasis and syphilis when the first demonstrable evidence of such disease occurs at the site of and following an occupational or alleged occupational injury. Some physicians believe that such interpretation is justifiable, and others will agree with me that it is not and that such cases differ appreciably from, for example, cases of infectious eczematoid dermatitis and dermatitis venenata following occupational injury. Until physicians have decided among themselves the medical interpretation of such issues they cannot expect legal provision for them in the compensation laws or unified court rulings on individual cases.

What seems to have been a more logical step than distorting the definition of injury has been the enactment of provisions for occupational disease, but here also there is controversy, this time centered about the definition of "occupational disease." The Connecticut statutes (1930) define it as "a disease peculiar to the occupation in which the employee was engaged and due to causes in excess of the ordinary hazards of employment as such" and "arising out of or in the course of his employment."[7] The general laws of Rhode Island define occupational disease as "a disease which is due to causes and conditions which are char-

2. Smith, K. D.: Report, Bureau of Occupational Disease, Division of Hygiene, Department of Health, Ohio, 1937.
3. Hayhurst, E. R.: Indust. Med. 6: 329 (June) 1937.
4. Sappington, C. O.: Indust. Med. 6: 229 (May) 1937.
5. Bull. 625, Bureau of Labor Statistics, U. S. Department of Labor, 1937.
6. Doyle, E., Massachusetts Department of Industrial Accidents: Personal communication to the author.
7. Bull. 13, State of Connecticut, 1935.

acteristic of and peculiar to a particular trade, occupation, process or employment."[5] Michigan (1937) defined occupational disease as did Rhode Island and North Carolina and stated that the disablement of an employee by reason of an occupational disease "shall be treated as the happening of a personal injury by accident. . . ."[5] A number of states simply name the diseases to be considered occupational or the activities in which occupational diseases may occur. These are the so-called schedules, and there are eleven states (Delaware, Michigan, Minnesota, Nebraska, New Jersey, North Carolina, Ohio, Pennsylvania, Rhode Island, West Virginia and Washington) that restrict compensation for diseases of the skin to the diseases or industries listed in such schedules. An amendment proposed for the New York law would state that "an occupational disease is a disease which is the natural and unavoidable result arising from conditions that are characteristic of or peculiar to a particular trade, process, occupation or employment in which the employee was employed or engaged."

Sappington[6] defines an occupational disease as "one which occurs with definite frequency and regularity in occupations in which there is a specific exposure as the cause which operates to produce effects in the human body recognizable clinically by the medical profession as pathological changes and effects, produced by the specific exposure involved." The Illinois acts of 1937[7] define occupational disease as follows:

> In this act the term "occupational disease" means a disease arising out of and in the course of the employment. Ordinary diseases of life to which the general public is exposed outside of the employment shall not be compensable, except where the said diseases follow as an incident of an occupational disease as defined in this section. A disease shall be deemed to arise out of the employment only if there is apparent to the rational mind upon consideration of all the circumstances, a direct causal connection between the conditions under which the work is performed and the occupational disease, and which can be seen to have followed as a natural incident of the work as a result of the exposure occasioned by the nature of the employment and which can be fairly traced to the employment as the proximate cause, and which does not come from a hazard to which workmen would have been equally exposed outside of the employment. The disease must be incidental to the character of the business and not independent of the relation of employer and employee. The disease need not to have been foreseen or expected but after its contraction it must appear to have had its origin in a risk connected with the employment and to have flowed from that source as a rational consequence.

The Illinois definition appears to me to be the clearest, broadest and most liberal that has been introduced for occupational diseases, and it defines "blanket" or "all coverage" provisions perfectly.

### PROVISIONS FOR COVERAGE

The objections raised to "blanket provisions" are that they increase the difficulties and widen the margin of error in diagnosis and that they are uneconomical. This is frequently true because of inadequacies of the law, but where blanket legislation has been intelligently interpreted and fairly applied it appears to have worked out satisfactorily, though the costs of compensation have naturally mounted considerably. A sociologic question involved is whether it is desirable to protect a workman against injury or disease only in hazardous occupations or whether it is desirable to provide for his care in any and all instances of occupationally acquired disease. The latter provision would meet a socialistic demand but would naturally increase the financial burden, which is inevitably shouldered by the tax payer. In discussing forensic aspects of dermatitis Cox[8] has remarked that "in the course of a year many persons suffer from dermatitis caused by external contact with some chemical substance or product of industry, those who suffer in person or through their skins, and those who suffer—not always vicariously—through their pockets, paying for the others." Are the progressive law makers giving proper consideration to this second group, and if they are not, does not protection lie in "scheduling" occupational disease and injury?

Great Britain, which compensates for incapacity for work instead of for loss of employment, has the schedule system and found that it cost £12,000,000 in 1930, with cases tripling the number anticipated when the act was established.[9] Little emphasized the need of skilled medical inspectors in factories and constant clinical and laboratory research to reduce prohibitive costs.

Britton[10] said that a fair legal plan for occupational diseases depends fundamentally on medical knowledge and that a fair knowledge of this subject is at present possessed by a comparatively limited number of physicians.

An occupational injury can usually be exactly established as to its time, place and manner of onset, but an occupational disease cannot usually be confirmed in this manner, and the history of the case, as obtained from the patient, therefore becomes a big factor in the establishment of a diagnosis. A recognition of human frailty in this regard, especially when there are monetary considerations involved, makes evident the need of more exact methods of diagnosis, or of supplementing diagnosis, than are now available in dermatologic cases in the limited fields of the not infallible patch test, the trichophyton test and laboratory aids in the diagnosis of fungous and bacterial diseases.

There are nine states (California, Connecticut, Illinois, Indiana, North Dakota, New York, Massachusetts, Missouri and Wisconsin) with blanket coverage. The International Association of Industrial Accident Boards and Commissions recommended the adoption of blanket coverage, and at a conference on labor legislation called by the Secretary of Labor in 1934 the committee on workmen's compensation recommended that the term injuries be specified to include occupational diseases and that the blanket coverage of occupational diseases be encouraged.[5] The American Bar Association, studying occupational disease legislation in 1937, recommended the schedule system for states, with special provisions for particular diseases, and a medical board and a bureau of industrial hygiene for each state.[4]

In 1937 the legislatures of Delaware, Michigan, Nebraska, Pennsylvania, Rhode Island and Washington passed occupational disease legislation under schedule provisions, inclusive of certain specified dermatoses, such as dermatitis venenata. In 1936 and 1937 New York, Illinois and Indiana enacted blanket legislation. Oklahoma provided coverage through a state insurance law.

The Committee on Standard Practices in the Problem of Compensation of Occupational Diseases of the American Public Health Association[11] recommends the schedule system and includes in its list of diseases infection or inflammation of the contact surfaces of the

8. Cox, H. E.: Med.-Leg. & Criminol. Rev. 5:123 (April) 1937.
9. Little, Sir E. Graham: Indust. Med. 7:117 (March) 1938.
10. Britton, J. A.: Indust. Med. 6:385 (June) 1937.
11. Committee on Standard Practices: Am. J. Pub. Health 27:72 (supp. vol.) 1937.

skin due to cutting oils or compounds or lubricating oils, dermatitis venenata (occupations specified), epitheliomas (causes specified), ulceration of the skin due to chrome, caustics, acids and alkalis, and some other dermatologic conditions.

In schedule states the law is usually worded thus: "The following diseases shall be considered occupational diseases and compensable as such when contracted by an employee in the course of his employment and due to the nature of any process described herein." Then follows a list naming a few diseases, commonly anthrax, glanders, chrome ulcers and, more recently, silicosis, and listing oils and lubricating compounds, dusts, fumes, vapors and gases and the heavy metals. The listing of processes may be worded "any industrial process in which the use of" a specified material or "any industrial process caused" in a specified manner.

Industrial dermatoses have not been defined in any compensation law, though some schedules make provisions for occupationally acquired dermatitis venenata (Rhode Island, Michigan, Washington and Oregon). As a basis for specific dermatologic provisions in the law, it may be well to consider the hypothetic law drawn up by Sulzberger:[12]

> When an employee suffers from any skin condition, or from the sequelae of any skin condition, in which his occupation can be proved, beyond reasonable doubt, to be, directly or indirectly, a causal or contributory factor, such employee is entitled to compensation commensurate with (a) the degree to which the occupation is responsible for the skin disease and/or its sequelae; and (b) the extent and duration of the skin condition and/or sequelae, the resulting discomfort, disability and/or disfigurement. Such employee is further entitled to the payment of the reasonable costs of adequate medical attention and treatment, administered through qualified physicians, hospitals, etc. of his own choice; and such employee is further entitled to such reasonable costs of investigation, and of expert testimony as may be necessary in order to substantiate his claim.

I believe this is too inclusive and have suggested modifying it to read in substance "that an employee be entitled to compensation only when his occupation can be proven, beyond reasonable doubt, to be, directly or indirectly, a causal or contributory factor in the production of the dermatosis, and that compensation be commensurate with the degree to which the occupation is responsible for the skin disease."[13] A definition of this nature, in appropriate legal phraseology, would require provision for competent dermatologic examination. I do not consider the average employee capable of selecting competent medical aid for the examination of a special disease and therefore favor selection from a panel, but once a diagnosis of occupational disease has been established, some latitude may be allowed the employee in the matter of medical and hospital care.

### CHOICE OF PHYSICIAN

Free choice of physician by the patient in compensation cases is the rule in ten states (Iowa, Missouri, Montana, North Dakota, Ohio, Oregon, Rhode Island, Texas, Pennsylvania and Washington) and is provided, with certain restrictions, by the panel system, which prevails in six or more states (Connecticut, Colorado, Kansas, Minnesota, Tennessee and Wisconsin). In eight or more states the law specifies that the employer must provide the physician. The growing provision for free choice of physician is bound to lead to participation by a larger number of physicians in this field, and while the amount of work for dermatologists will probably increase, there will be a greater need for training of the general physician and surgeon in industrial dermatology. However liberal the law regarding the choice of physician, it should provide for the services of a specialist on the request of the patient, the employer or the insurance carrier. This applies particularly to cases of dermatosis in which there may be a reasonable question of diagnosis or a particular problem in treatment.

When a workman consults a physician privately, there is only the doctor and patient relationship to consider, but when the disease is a compensable one, or possibly so, the case extends beyond these confines and the physician should recognize the added responsibility, his limitations in the diagnosis or treatment of a special disease and his moral obligation to seek consultation or assistance when it appears indicated.

The more liberal the law, the greater the margin of error in its application and the greater the economic burden of those who pay the bill. The safeguards lie not only in the integrity of those who construct, interpret and apply such laws but also in the intelligence and honesty with which the physician carries out his responsibilities under the law. A high degree of skill in differential diagnosis and painstaking study to assemble and correlate factual evidence are necessary in many cases to do justice to both workman and employer. The dermatologist with experience in industrial dermatoses recognizes the complexities of some of these problems and appreciates the large margin of error frequently occurring when the law is in advance of average medical knowledge and skill. The law is also at times in advance of the insurance carrier, who is often unwilling to pay the initial bill for comprehensive investigation by medical experts but who patiently carries the load of prolonged dribbling compensation payments for disability and medical care in cases in which liability need never have been assumed.

### COMPENSATION FOR NONDISABLING DISEASE

Sappington[4] said "It is the intent of the laws to compensate for *disability* resulting from occupational disease; the employer should not be required to pay compensation for a diagnosis." I do not agree with this, for an untenable situation is created when the law applies only to disabling or partially disabling diseases, the workman being liable for his medical care when there is no disability, the employer when there is disability. However, this is the law in ten states (Arizona, Georgia, Montana, Kansas, Tennessee, Texas, Pennsylvania, Rhode Island, Virginia and West Virginia), while fifteen others now provide for the payment of medical care for nondisabling disease (California, Connecticut, Delaware, Idaho, Iowa, Minnesota, Missouri, Michigan, North Carolina, North Dakota, Oregon, Ohio, Massachusetts, Washington and Wisconsin). The latter provision is undoubtedly the only rational one, for it permits early examination, with resultant greater facility in diagnosis, and more effective therapy, with consequent reductions in cost. A diagnosis is the first essential step in the consideration of a potential case of occupational disease. In many dermatologic cases, in which examination by a dermatologist is not made until disability has occurred, a correct diagnosis cannot be made with absolute certainty.

12. Sulzberger, M. B.: Am. J. Surg. 20: 531 (Dec.) 1933.
13. Foerster, H. R.: Observations on Industrial Dermatology, J. A. M. A. 107: 247 (July 25) 1936.

### MEDICAL BOARDS

It seems a logical procedure that laws concerning disease, the medical provisions of which were devised and enacted by nonmedical men, should be not only enforced but also interpreted by nonmedical men. I have not found legal provision in the laws of any state for the appointment of physicians as commissioners or examiners, and it is evident that in many states the weighing and sifting of medical evidence in disputed cases is done entirely without medical advice or guidance except that obtained from medical witnesses involved in specific cases. It is gratifying therefore to observe a growing recognition of the importance of physicians in this work and their assignment to it, and, no doubt, as the provisions to cover industrial dermatoses are broadened, the increasing complexities of the medicolegal aspects of dermatoses will create opportunities for properly qualified dermatologists functioning in official capacities.

At the present time the industrial commission of Ohio has on its staff a medical department of seventeen full time physicians, one of them designated medical director; the Oregon commission has six physicians, of whom one is a full time appointee, and California has five medical directors. The recent Michigan act provides for a board of three impartial physicians to investigate controversial cases, a provision that has long prevailed under Massachusetts law. Six states (Kentucky, New York, North Carolina, Pennsylvania, Washington and West Virginia) have some other form of medical board, and the commissions of six other states (Arizona, Georgia, Iowa, North Dakota, Rhode Island and Virginia) each have at least one medical adviser, usually a full time appointee. Six states (Connecticut, Maine, Missouri, Texas, Pennsylvania and Wisconsin), while having no official medical appointees, have empowered their commissions to select medical aid when it is deemed advisable.

### NEW LEGISLATION

In 1935 the Maryland legislature created a commission for the study of occupational disease which conducted an investigation with the cooperation of its state health and labor departments and the surgeon general of the United States, held public hearings, and took the testimony of state and national authorities on all phases of the industrial disease question, and submitted an act for compensation legislation which was recently passed by its senate but failed of enactment in the house.[14] I am reporting on it because it is a most desirable kind of legislative proposal on this subject, and if it is not subsequently enacted into Maryland law it may still serve as a model for the consideration of other states.

The proposed Maryland law provides for a medical board whose reports and findings on medical questions in cases involving occupational diseases may not be modified or changed by the industrial commission. It also provides "that in all appeals in which occupational diseases are involved, the findings of fact by the Medical Board and by the State Industrial Accident Commission shall be final and not subject to review or modification by the Court or be submitted to a jury." This law specifies that the medical board shall consist of three members, appointed for terms of six years (a new appointee every two years), two of whom shall have had at least five years of practice in the diagnosis, treatment and care of industrial diseases and one of whom shall be especially trained in roentgenology and who shall have had at least five years of practice and experience. These licensed physicians of good professional standing shall be appointed by the governor by and with the advice and consent of the senate from a list of nominees to be submitted by the deans of the medical departments of the University of Maryland and Johns Hopkins University and by the Council of the Medical and Chirurgical Faculty of Maryland.

The 1937 Idaho legislature authorized and instructed the state division of public health to conduct a statewide survey of occupational disease and charged it with reporting on some pertinent questions.[15] Information was requested on the prevalent occupational diseases, the extent of their prevalence, the best standard practices of industrial hygiene for the prevention of such diseases and what measures the legislature might promulgate to facilitate the adoption of such preventive practices. The legislators also inquired as to what measures the legislature could construct to compensate workmen disabled by occupational disease and how much compensation such workmen should reasonably receive. Also, and these questions may be unusual though important for legislators to ask, they inquired how much it was going to cost employers to insure payment of compensation for occupational diseases and to what extent the cost factor would be likely to affect the continuance and expansion of industries in which occupational diseases arise. Furthermore, they inquired as to limitations and instructions, particularly as to medical procedure and practice, to keep costs at a reasonable rate. I have reported this in detail because it is an enlightened approach to contemplated workman's compensation legislation that should receive hearty endorsement and should result in a fair and liberal law.

The Committee on Standard Practices in the Problem of Compensation of Occupational Diseases of the American Public Health Association[11] recommends that special provision be made in each occupational disease act for a medical advisory board to facilitate the settlement of claims, such board to be appointed by the governor from lists submitted by the state medical society. The functions of such a board would be related to the settlement of disputes regarding diagnosis, disability, causal relationship of occupation to disease and consideration of the medical aspects of claims for personal injury by accident. The members of such a board could function also as medical expert witnesses or could appoint such experts. It was suggested that qualified representatives of administrative medicine, medical economics, toxicology and legal medicine, pathology, radiology, industrial hygiene, surgery and dermatology constitute the personnel.

### HEALTH DEPARTMENT BUREAUS

With exception of the health departments of Connecticut[16] and Ohio,[2] which have long been active in this field and have accomplished much good, state health departments have not given official recognition to the subject of industrial disease until recent years. The Section on Preventive and Industrial Medicine and Public Health of the American Medical Association has long been aware of the major economic importance of

14. Waters, T. C., Maryland Commission for the Study of Occupational Diseases: Personal communication to the author.

15. Weissross, S., Department of Public Welfare, Idaho: Personal communication to the author.

16. Osborn, S. H.: Bulletin, Connecticut State Health Department, 1936.

the prevention of industrial diseases, and its activities represent the first national action of organized medicine in this regard. That section established a committee on research and standards with the object of studying and establishing standard practices and compiling information on occupational disease legislation that might be utilized by legislative and social agencies, employers, insurance carriers and labor organizations.

The entry of the federal government into the field of industrial medicine in the various states has been facilitated by provisions of the National Security Act, which has furnished funds for the setting up of bureaus of industrial hygiene within the state departments of health, which presumably will function in cooperation with the United States Public Health Service toward greater uniformity of industrial health laws and practices. Twenty-three such bureaus are now established (California, Connecticut, Illinois, Iowa, Idaho, Kansas, Maryland, Minnesota, Missouri, Mississippi, Michigan, North Carolina, South Carolina, New Hampshire, Ohio, Pennsylvania, Rhode Island, Tennessee, Texas, Vermont, West Virginia, Virginia and Wisconsin), and four are being established (Minnesota, Missouri, Idaho and Washington). Massachusetts and New York have bureaus of industrial medicine within the organization of their state departments of labor. These bureaus will concern themselves chiefly with the recognition and prevention of industrial disease, with statistical studies and with the promotion of industrial health, and they should exercise a beneficial influence on legislation. Industrial diseases are legally reportable to the boards of health in eight states and to the industrial commissions or analogous bodies in more than twelve states.

### ROLE OF THE DERMATOLOGIST

One may ask "What is the place of the dermatologist in this picture?" In the states where industrial diseases are compensable and reportable, statistical studies have shown that industrial dermatoses are more numerous than all other industrial diseases together, comprising approximately 60 per cent of the cases. The dermatoses likewise frequently present diagnostic difficulties requiring the services of competent dermatologists for correct interpretation, yet dermatologists do not appear to play an important part in industrial medicine in more than a dozen states. I know of only two dermatologists functioning in an official capacity, one in the United States Public Health Service and one on the new Council on Industrial Health. None of the recent legislative enactments or proposals for medical boards operating in conjunction with industrial commissions or for industrial bureaus in health departments indicate recognition of the importance of the dermatologist in this field. An amusing commentary on this situation, which is apparently similar in England, may be quoted from the remarks of Dr. W. J. O'Donovan* made before the Medico-Legal Society last year. He said in part:

> When the State chooses medical referees to sit in judgment on these great problems it eschews choosing the man who is experienced in dermatology. Those who sit as judges at dog shows and flower shows are those who understand the subjects, but a medical referee advising His Majesty's representative on the Bench may be one who is singularly interested in X-rays and understands many aspects of toxicology, but has avoided any tuition in skin diseases in his youth, and has since avoided any contact with skin departments at hospitals, as they are unclean, and yet his word in regard to dermatitis goes when he is advising his Honour on the Bench, or when he passes judgment on his colleague's work.

### CONCLUSIONS

While the medical provisions of many compensation laws are inadequate and ambiguous, the enlightened attitude of legislative bodies, as demonstrated in Maryland and Idaho as well as elsewhere, indicates that the door is not closed to active participation by the medical profession in the construction of appropirate laws covering industrial health and disease. Medicine, through properly selected representation, may advise in the construction and revision of medical provisions in compensation laws so that they will be intelligent, fair and impartial and may minimize the numerous controversial issues resulting when the designers of the laws have inadequate medical guidance. Similarly, medicine may participate with law in the more effective and just analysis and disposition of cases.

An achievement in medical progress in the field of industrial medicine has been the recent establishment by the American Medical Association of the Council on Industrial Health, in the development of which the industrial dermatoses committee of the Section on Dermatology and Syphilology actively participated. The title of this council is indicative of the broad scope of its sphere of activity, and one may anticipate a marked advance in coordinated medical effort and accomplishment in the various phases of industrial medicine, inclusive of medicolegal problems, through the deliberations of this body, on which the section on dermatology is represented by Dr. Earl Osborne.

To advance compensation legislation pertaining to dermatoses it will be necessary for the Section on Dermatology and Syphilology, preferably through its industrial dermatoses committee, to define properly industrial or occupational dermatoses and to establish proper criteria for diagnosis as a guide to legislative groups and with the laudable objective of reducing or eliminating controversial issues in industrial cases.

The responsibilities of this section in the medicolegal field include concerted efforts directed at obtaining enlightened legislation in every state to cover occupationally acquired dermatoses, at providing adequate instruction in the dermatologic aspects of legal medicine and at obtaining capable dermatologic representation on boards and commissions dealing with occupational dermatoses, all of which objectives may be approached through the new Council on Industrial Health.

208 East Wisconsin Avenue.

## ABSTRACT OF DISCUSSION

### ON PAPERS OF DR. LANE, DR. SCHWARTZ, DRS. SULZBERGER AND FINNERUD, DRS. OSBORNE AND JORDON, DR. DOWNING AND DR. FOERSTER

DR. CHARLES C. DENNIE, Kansas City, Mo.: This is one of the first times that such a comprehensive view of industrial dermatoses has been presented. The object of this conference is to coordinate the different factors that go into this view of industrial dermatoses and their proper handling so that justice may be rendered to the workman, to the industrialist, to the insurance carrier, and to the industrial dermatologist. Industrial dermatology is a new phase of dermatology. The industrial dermatologist must be first a dermatologist and in addition be trained especially in the recognition and treatment of industrial dermatoses. In most large industrial centers he must at least be a diplomate of the American Board of Dermatology and Syphilology. Of course that does not hold in the smaller communities. He must have on his staff an industrial nurse, technicians and possibly social service workers. The industrial nurse is a most important factor. She is more likely to pick up odds and ends that might escape the indus-

trial dermatologist and thus can make it possible for him to institute measures for the prevention and treatment of various diseases. It is important that she visit the families of workmen to determine that some factor there is not causing the dermatitis or continuation of the convalescence that otherwise would be shorter. A good illustration of that is the baker who, while he is receiving compensation, continues his same work at home in making his own bread, thus continuing his dermatitis. The next important factor is the industrial engineer, who must not only be trained in his specialty but must have a profound knowledge of sanitation in order to institute measures to prevent industrial dermatoses in industries of all kinds. The third important factor is the participation of the United States Public Health Service in this problem, for not only do these medical officers have knowledge of the different chemicals used in industries that might produce dermatoses but they know the compounds of those substances which are used in the manufacture of finished products. In the clothing industry many of these dermatoses are due to dyes the constitution of which is a secret of the manufacturer of the dyes. Officers of the United States Public Health Service also know the composition of practically all these dyes and will furnish these compositions to the industrial dermatologist, with the percentage of hazards and how they act. The fourth important thing is the medicolegal aspect of these matters. The great question is what constitutes an industrial dermatitis and what compensation the workman shall secure for it.

Dr. Cleveland J. White, Chicago: Dr. Lane's proposed graduate dermatologic instruction program would distinctly raise the professional plane of practice in occupational cutaneous diseases. A broader example of this suggestion has been the establishment of an industrial disease department in the division of medicine at the Northwestern University Medical School in Chicago under Dr. J. A. Britton. The paper of Drs. Sulzberger and Finnerud will be of immense help to all of us in trying to solve the perplexing diagnostic problems especially as concerned in the eczematous type. There is one part of this paper that I should like to comment on—the involvement of other workers in the same plant. I should like to ask how important that is. I think all of us are seeing many cases of which there is just one in that particular plant. Drs. Osborne and Jordon brought up a point that helps decide the question about the prophylaxis of cutaneous diseases and the value of the patch test. I am going to accept their opinion 100 per cent that it is of little practical importance in a large percentage of the cases when a great many tests have to be done. Osborne and Jordon's representative case of the man who had become turpentine sensitive acquiring a generalized exfoliative dermatitis brings home again the necessity of trying to determine the exact etiologic contact agent in the disease. Dr. Downing's case reports were of great benefit. There is one bit of advice by which we can all profit, and that is to give an impartial decision to the best of our knowledge, and not just make another opinion to be different. That is very important if our dermatologic advice is to be continually sought and utilized. We all endorse Dr. Foerster's suggestions so that dermatologic experience and judgment can be utilized to advance proper compensation legislation.

Dr. Hiram E. Miller, San Francisco: In Dr. Lane's educational program I cannot understand how he expects opportunities for the study of occupational dermatoses to be found in clinics. These patients are not and should not be in clinics. They are found in the offices of the industrial surgeons and dermatologists and must be studied there. He states that insurance companies in many instances depend on the general practitioner for final diagnosis of industrial dermatoses to save expense. In this vicinity this is true only in outlying districts and in small towns. Several insurance executives have told me that they save time and money by getting the best available dermatologic opinion. I agree with Dr. Lane that medical schools should have definite courses on all phases of industrial medicine. I should like to ask Dr. Lane if in the examination of diplomates they are questioned on the subject of industrial dermatology. Dr. Schwartz states that 30 per cent of all dermatoses are found in the metal industries. I wonder whether these figures may not be misleading. This type of industry has probably been better studied than some others. Most of the patients that I see with industrial dermatitis come from small plants or establishments with only two or three employees and absolutely no supervision as to industrial hazards. These small industries are not considered in Dr. Schwartz's figures. Some of the practical aspects of the prevention of industrial dermatoses mentioned by Drs. Osborne and Jordon will be difficult to carry out. They advise that prospective employees with ringworm should not be employed in many industries. In view of the high incidence of dermatophytosis, this does not seem to be feasible except in certain limited cases. They also state that to prevent sensitization dermatitis the patients should quit work until well and then do entirely different work. This is correct, but I do not believe that it is possible to carry it out in most instances. There are several points in Dr. Downing's paper that should be emphasized. He states that only 3 per cent of patients examined by him contested his opinion as to a nonindustrial dermatitis. It is the examining dermatologist's duty to explain to the patient why his dermatitis is not due to his employment. In most instances litigation can be avoided if this is done. It must be remembered that litigation is often of much more expense to the insurance carrier than the payment of compensation and medical care would have been in the disputed case. Another important point is that a qualified dermatologist should be a diplomate. Dr. Foerster's discussion on compensation laws is most interesting. In California the term "injury" includes "any injury or disease arising out of employment." This seems to be too broad a definition, and we are constantly forced to accept dermatoses that are very remotely due to employment. The Connecticut law states that "personal injury shall not be deemed to arise out of the employment unless causally traceable to the employment other than through weakened resistance or lowered vitality." This seems to be wisely stated and fair to all concerned.

Dr. Joseph V. Klauder, Philadelphia: I may take the liberty of offering an unofficial opinion. There are many practical phases of this subject. I think it would be educational if we could hear the opinion, for example, as to this practical phase: How long should the carrier be responsible for the continuation of a chronic eczema due not to a specific agent, for example, washerwoman's eczema? Should the carrier be responsible for the further spread of the eczema? How long should the carrier be responsible for an outbreak of tinea, for example, aggravated by occupation? Should the carrier be responsible for subsequent outbreaks? I should like to call on Dr. Rothman of Budapest.

Dr. Stefan Rothman, Budapest, Hungary: I thank you for the honor of being able to take part in the discussion and to hear the excellent papers. I am in charge of a dermatologic clinic at the Institute for Social Medicine of the Hungarian government. A few data concerning the industrial eczemas in Hungary may be of interest. In 1937 there were 1,500 dermatologic cases treated, 206 of which were industrial eczemas. They were all tested by a number of patch tests, the number depending on the history of the patient. Fifty-three, or about 26 per cent, of the cases were caused by crude machine oil and were seen in all kinds of workers using machines. The second large group, consisting of thirty-one patients, or about 15 per cent, was represented by workers using organic solvents for cleaning their hands, such as benzine, turpentine and acetone, or using soaps containing coal tar derivatives, formaldehyde, turpentine and so on. Persons sensitive to turpentine are often not sensitive to the rectified product, but they are sensitive to the one used in their shop. Another group, seventeen, or 8 per cent, was that of the masons. Their sensitivity to lime, mortar or cement could not be demonstrated by the patch test as a rule but it was always suggested by the improvement which followed when the patient stopped working. Somewhat related to groups 1, 2 and 3 is group 4, consisting of thirty-nine, or 19 per cent, household workers who were exposed to very alkaline soaps and soda. Here again the sensitivity was not directly provable. The fifth group is that of the bakers, twenty-nine, or 14 per cent. Most of these were sensitive to coarse flour containing some bran and not to fine flour. None of them were sensitive to substances used as baking powder or

for bleaching. Seven cases of occupational primrose eczema were also observed. Three patients were gardeners, but four were waiters in a big hotel where the primrose is favored, as it is in spite of frequent warnings in many places on the continent. A case of sensitiveness to fly poison extensively used on farms is noteworthy. Another interesting case, which was observed several years ago, is that of an employee of a street car company who had continuously handled coins during his daily work. He had a severe exudative eczema on the uncovered parts of the body before the sensitivity to nickel and copper was discovered by testing with solutions of nickel and copper sulfate in a dilution of 1:10,000. The remainder of cases were caused by mechanical and thermic trauma. This is a small group of cases but is representative of the material that is seen every year. In questions of compensation and change of occupation we have, as I have noted, the same difficulties as you have in this country.

DR. R. H. BLAISDELL, Boston: It would be useful in the larger communities if the insurance companies could establish a central agency to which cases of reemployment could be referred. For instance, recently I saw a dissolver who received a dermatitis from sodium silicate. I recommended that he be given a different form of employment. He was given an outdoor job under a foreman in the yard, but in the course of his work he cleaned out freight cars which still contained sodium silicate and he had a recurrence. Protection is excellent, but protection itself has its hazards. A tannery that had trouble provided its men with rubber boots, rubber gloves and rubber aprons, but the men were permitted to work with bare arms from the tops of the rubber gloves to their shoulders, and the net result was nothing. A division of a chemical plant was having trouble and gave its workers rubber gloves. The first shipment consisted of yellow rubber gloves, and the resulting dermatitis was more expensive than the original outbreak from the chemicals. The dermatologist has a distinct place in the medicolegal phase. In Massachusetts in 1935 a new section of the law was added whereby all cases of industrial disease shall be referred to a board of impartial referees. The cost of such a referee examination was $15 for each of three men, $45 for each examination, and where there were hundreds of cases the expense was intolerable. The net result was that the Industrial Accident Board made a ruling that industrial dermatoses are industrial injuries and not diseases. The act also provided that the conclusions of this impartial board should be final by diagnosis only and not with any judgment as to industrial complications. Therefore the cases come before the referee board and return to the industrial board with a diagnosis of dermatitis and it is left to the industrial board, the layman, to determine whether that is related to the work or not, and when the workman turns up before the referee board having completed his examination they return the illuminating diagnosis of no disease, and in several cases the workmen received no compensation at all; then the board wisely made a change providing that the referee board's finding should be final as of that day only, and that their own findings should depend on the previous testimony and future testimony. If I may take the liberty, I should like to add to Dr. Dennie's list one thing, that is, the plain, everyday, ordinary taxpayer, who in the long run pays for all this.

DR. H. J. PARKHURST, Toledo, Ohio: It is very well to advise that the patient be given a different job, but this advice may have no practical value. The employer's hands are often tied by seniority rules, so that he is unable to place the patient in another occupation in the same plant, even in his own plant. The patient is often too old to find suitable work elsewhere so as to support his family. He may have spent years acquiring skill at a certain trade and be unable to change his work and still support himself and his family. He should not then become a public charge; that would be wrong. It is up to us to improve our preventive methods, especially regarding ointments, pastes and similar protective applications. There are certain applications of this kind on the market at present, but they are far from being infallible.

DR. ELMORE B. TAUBER, Cincinnati: I want to suggest that these papers be published as a monograph.

DR. M. T.-R. MAYNARD, San José, Calif.: I think the patch test has been somewhat slighted in the discussion today, and I want to make a few remarks appropos of that. First, the application of the patch test should be made as close as possible to the area that is reacting, if possible even within the border of that area. If no reaction occurs at the time the dermatitis is active, it is also advisable to repeat the patch test after the dermatitis has healed, because then one may get a positive reaction when the patient has not used up his antigens. Secondly, is it possible to reproduce the conditions under which the patient works? I recently had a case in which a man was reacting sharply to the leather dye in the tongues of his shoes. He failed to produce any positive patch test to the tongues of his shoes, but he had been working at cleaning out kilns in a pottery factory, and he would go into these kilns when they were quite hot, and his feet would sweat profusely. When sent back to work with a patch test in place he reacted to it markedly. Another thing is the dilution of the irritant. Naturally if a man is exposed to hydrochloric acid or sulfuric acid or some strong irritant he will react to that. One has to use dilutions that are tolerated by the skin without a lytic action but which will produce an allergic response. The reaction should be read immediately on removal but should be read again probably within five days and even sometimes within two weeks, because a true allergic response will often not occur on the immediate removal of the test but will show up later. I had one reaction that developed almost two weeks after the application of oil cloth, and it persisted for three weeks thereafter exactly in the configuration of the patch test. A word of caution: Do not run the risk if the patient is highly allergic of applying very much of the substance to which one suspects that he reacts, otherwise he may develop a generalized exfoliative dermatitis or exfoliating reaction. These remarks are hardly necessary for the dermatologist, but I assume that there are many here who are not dermatologists.

DR. JOSEPH GRINDON, St. Louis: A point already mentioned by Drs. Osborne and Jordon and repeated by Dr. Miller is the importance of the cleansing agents used after the day's work is finished, such as strong soaps, among others soaps coptaining cresol or mercuric iodide. All medicated soaps, all soaps advertised as "health soaps," all soaps advertised as being endorsed by the medical profession, are anathema maranatha. The only thing that should go into soap is soap. Another thing to deplore is the aggravation of industrial conditions by unwise therapy. Some cases are made worse by the use of ammoniated mercury. The U. S. Pharmacopeia lists an ammoniated mercury ointment of 10 per cent strength, whereas 2 per cent is plenty, usually. One other thing: Almost every general practitioner, when he prescribes an antipruritic lotion, uses phenol. The common zinc calamine lotion, pink lotion, will have some phenol in it. I never use phenol. Of course it is an antipruritic, but a large minority of the population are atopic to phenol, so that I think it wise to leave it out altogether, especially as there are other antipruritics that are just as efficient, such as resorcinol.

DR. E. F. TAUB, New York: In New York State only within the last two or three years have the dermatologists been given any recognition at all on the Committee on Industrial Diseases, and then only on a subcommittee. The problems that have come up before that committee have probably been largely of local interest, but I should like to mention two or three that have caused us the most trouble. One is the matter of pay for the physicians who examine and study a case and then that case proves to be in their opinion not of industrial causation; the insurance carrier will not infrequently refuse to pay the doctor for the examination and the time spent in making a diagnosis. Probably this causes many a physician in cases in which there might be the slighest doubt to place the case in an industrial category simply because he knows that only in that way is he sure to be paid. There should be some definite provision for payment in these cases. Another point that has caused difficulty is the matter of cutaneous testing, particularly the trichophyton and patch tests. We have recommended that the trichophyton test be given no consideration whatever as a diagnostic agent. In most cases the trichophyton test if positive does not signify that that particular eruption is ringworm in any sense, nor does a negative

test exclude ringworm; hence the test in any single given case is of no value diagnostically. Patch tests as performed rarely duplicate the patient's actual working conditions. In the first place we are often not supplied with all the materials he actually handles and, if we test him with other supposedly similar chemicals they may actually not be the same, as they have come from another manufacturer, who may have used an entirely different refining process. If we are given the exact materials we do not always find it easy to simulate the exact conditions of employment in which friction, trifling trauma and other conditions may play an important role. Therefore it should be emphasized that a negative patch test would not necessarily exclude the case as an industrial one and a positive patch test might not necessarily prove it, as the testing may not have made due allowance for possible primary irritants.

Dr. C. Guy Lane, Boston: Both the theoretical side and the practical side have been well emphasized today by the papers in this symposium. The three most important items which are necessary at the present time have also been emphasized. It is difficult to place these in logical order. As I mentioned earlier, education is a prime necessity. I think also that the matter of definition of criteria is perhaps of equal importance, definition of criteria in general, definition of criteria as outlined by Drs. Sulzberger and Finnerud with regard to dermatitis in particular, and with regard to termination of disability. The matter of definition of terms used is important, and I believe that the Council on Industrial Health can help out a great deal in these particular phases. The third item of importance is the matter of investigation. The investigation of causes, as brought out in Dr. Schwartz's paper, and with reference to prevention by Drs. Osborne and Jordon, are two of the prime needs in this particular field today.

Dr. Louis Schwartz, New York: I want first to answer Dr. Miller, who questioned the figures that I quoted as to causes of dermatoses in the United States. The figures from which my charts were compiled were gathered from states which have laws reporting occupational dermatoses. Those states send monthly, some of them weekly, reports to my office of the number of cases of occupational dermatoses, the causes and the industries in which they have occurred; the tables were compiled from those figures. They comprise over 9,000 cases that have been reported to my office. The remarkable thing about them is that our statistics correspond closely to similar statistics compiled in England, and from what Dr. Rothman said they correspond closely to figures compiled in Hungary. One of the doctors in his paper stated that he believes in removing from the job all workers who contract dermatitis. In my experience in factories I have found that there are many new workers who come on a job where there is a skin hazard who contract a dermatitis, but if they stay on the job for a while, a week, two weeks, three weeks, with this mild case of dermatitis, they are apt to become immune or, as the workers say, "hardened to it." If you take such a man off the job and let him get well, he again develops a dermatitis if he goes back to the job again; but if you let him continue on the job and let him get well on the job, giving him protective clothing, ointments, and what-not, while he is working he is apt to stay immune as long as he is working, and this immunity will last perhaps a month. If he discontinues work, he will retain his immunity for a considerable length of time, say two or three weeks or a month, but if he leaves that occupation for six months or a year and returns again he is apt to go through the dermatitis and hardening process again. Old workers who work at a job can pursue it for as long as twenty years without any trouble and then develop dermatitis at the end of that time; they have developed a sensitivity to some of the chemicals with which they work. Such workers never develop an immunity and they should be taken off the job and given another occupation where they do not come in contact with the irritant to which they are susceptible. Dermatologists who are called on to diagnose industrial dermatoses and to testify before industrial commissions should familiarize themselves with the exact nature of the patient's work. It is not sufficient for them to look at the lesion and do patch tests and give testimony and expert opinion on that.

Dr. Clark W. Finnerud, Chicago: It is the opinion of Dr. Sulzberger and myself that so far as is practical it should be stressed that, although the physician should be familiar with the laws at least in his own state, he should confine his opinion purely to the medical aspect of a given case. The legal status has appeared to us to be solely the function of the legal profession, although, as mentioned by Dr. Foerster, medical criteria must be plainly formulated for the legal profession by the dermatologist. We have tried to incorporate in the paper essential definitions throughout. In answer to Dr. White, if I understand his question, I would say that the presence of a similar disorder in other workers in a given plant simply adds weight to the physician's opinion as rendered in a given case. We appreciate the shortcomings of our tables of criteria, but the text in a measure clarifies some of these points.

Dr. Earl D. Osborne, Buffalo: Dr. Miller referred to the statement which Dr. Jordon and I made regarding the presence of ringworm as a reason for turning down a worker for employment. We referred, of course, only to the presence of a generalized sensitivity, or dematophytid, in the presence of an active ringworm, and not to a localized chronic ringworm of the toes, as a reason for refusing employment. Regarding the point that Dr. Schwartz mentioned, namely, the hardening process, I am of the opinion that it does not apply to sensitization dermatitis. That has been demonstrated clinically and experimentally as not occurring. It has been shown that, once a person has developed a sensitization dermatitis to a certain specific chemical, it requires many days, months or years for that dermatitis to disappear, and sometimes it never does. My impression of the hardening process is that it occurs when individuals are exposed to a primary irritant repeatedly over a number of days, resulting in a hyperkeratosis which acts as a mechanical protective agent. I want to emphasize again that experimentally, scientifically and clinically there is no such thing as a hardening process in true sensitization dermatitis.

In mentioning the transfer of an employee from a job to some other type of job, we referred only to individuals who had developed a sensitization dermatitis and not to individuals who had a primary irritative dermatitis. I believe that one of the most important things in the prevention of industrial dermatitis due to sensitization is the early recognition that it is a sensitization dermatitis and not an irritative dermatitis, with the transfer of that employee to another job where he does not handle the offending allergen. In New York state we have a rehabilitation committee assigned to each industrial board, and every employee who develops a true sensitization dermatitis, where we recommend that he be transferred to another job, has his case taken into consideration by this committee and he is placed in some other line of employment, or the plant or industry finds other work for him. We do not refer to the application of patch tests in the diagnosis of industrial dermatitis, only to the preemployment examination. My own impression of patch tests as applied to diagnosis is the same as in the practice of dermatology generally—only a well trained dermatologist with a great deal of clinical experience in evaluating the application and limitations of the patch test in practice should do it. In my opinion, clinical trial and experience many times are of greater value than the patch test in industrial dermatoses.

Dr. John G. Downing, Boston: At our exhibit on industrial dermatoses, various observers cited interesting cases of ergodermatoses occurring in their practice. Physicians should report these cases, for such reports may help to solve the problems of other medical men. For example, a clinical note on dermatitis due to sawdust (Levin, O. L.: Sawdust Dermatitis, The Journal, Feb. 25, 1933, p. 570) helped to solve the question of an outbreak of dermatitis occurring among building cleaners who were in contact with numerous irritants at their work. Patch tests with the sawdust with which they came in contact were positive. The workers were supplied with a small shovel with which to scatter the sawdust about, and no more cases occurred until a year later, when a shovel broke and was not replaced and a new outbreak occurred. I agree with Dr. Schwartz that it is better to keep a man on the job, for he may become desensitized and is less apt to get a compensation complex.

All dermatologists have seen workers, such as molders of bakelite, who have been able to work for years with only periodic attacks of dermatitis which have been relieved by treatment while the patient continued to work. These men, however, should be watched carefully; they should be examined daily, and if their eruptions continue to spread to any marked extent they should immediately stop work. As long as the eruptions remain stationary or improve there is no reason for the patients to stop work, because if these men stop work they rarely can return to their trade.

DR. HARRY R. FOERSTER, Milwaukee: I cannot agree with the suggestion that legal considerations be left to the legal profession; there is too much involved in this question of medicolegal interpretation of industrial dermatoses. Controversy arises chiefly in states that have "blanket coverage," such as progressive Wisconsin and liberal California, referred to by Dr. Miller. Wisconsin was the first state to have a compensation law and the first state to appoint an industrial commission. Originally coverage applied only to injuries sustained in occupational accidents, and that law is still on the books, but injury has been redefined, so that injury is now interpreted as "mental or physical harm" to an employee. That may mean almost anything. The only safeguard to the employer in a state with such liberal laws lies in an efficient commission. While in our state the examiners and commissioners are laymen, fortunately they are intelligent, capable and experienced and they exercise a good deal of judgment and common sense in their interpretation of cases.

## ALLERGY IN CHILDHOOD

### PROPHYLAXIS, EARLY RECOGNITION AND TREATMENT

W. AMBROSE McGEE, M.D.
RICHMOND, VA.

Any attempt to reduce the incidence or severity of a prevalent disorder is certainly worth while. And certainly the axiom "an ounce of prevention is worth a pound of cure" is a most practical one, especially as it pertains to childhood allergy. The management of allergic children might be said to begin with conception.

Research by several investigators, most noticeably Ratner, reveals the possibility of active or passive intra-uterine sensitivity. Observance of mothers from conception to delivery presents certain ideas which apparently have practical significance. Sensitivity of the skin to foods such as eggs which have not been ingested or with which an infant has not been in contact suggest inherited or intra-uterine sensitivity.

It is a frequent observation that clinical sensitivity often abates during pregnancy. Such knowledge plus the possibility of passing specific sensitivity in some manner to an offspring should make mothers reasonably avoid during pregnancy the foods to which previously they were clinically sensitive. Moreover, as an overindulgence of any food is more apt to result in sensitivity than when moderate amounts are ingested at intervals, food cravings should not be indulged during pregnancy.

Since milk, especially the lactalbumin, and eggs are the foremost etiologic allergens in infancy, it seems reasonable to suggest that mothers drink boiled milk in the later months of pregnancy and avoid an excess of eggs. It is also plausible not to force foods to which there is a definite and prolonged dislike.

Read before the Section on Pediatrics at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 17, 1938.

Before the infant of allergic parents arrives, its future environment, especially its room, should be prepared as free from inhalant substances as possible. While it is admitted that the majority of allergic disorders of infancy are traced to foods, inhalants such as feathers, hairs, face powders, sprays, kapok, dusts and pollens are not infrequently etiologic factors.

The next prophylactic measure is concerned with the new infant's diet. People have been brought up to believe that milk is the most perfect food for every one, little or no allowance being made for those with lactalbumin or casein sensitivity. Fortunately the use of boiled, powdered or evaporated milk usually takes care of sensitivity to the lactalbumin factor. While undoubtedly the majority of infants take some form of milk well and thrive nicely, more than is generally agreed on cannot tolerate it clinically. When casein sensitivity is present boiling, powdering or evaporation of milk, contrary to statements or propaganda in favor of evaporated milk, does not overcome the trouble. Owing to the increased permeability of the intestinal mucosa during the first two or three days of life, it is wise not to offer cow's milk then. The use of "vegetable milks" is generally very satisfactory when casein sensitivity occurs and in my experience is most satisfactory to patient, parents and physician. There appears to be no increase in sensitivity from the use of "vegetable milks"; on the contrary, when the main allergic factor is milk, the forcing of it in a casein-sensitive infant is likely to give rise to further food trouble.

When a new vitamin substance or food is introduced a small quantity should be offered once and not repeated again for three days. Such an interval gives ample time for sensitivity to manifest itself. Among potentially allergic infants it is better to introduce a single substance and avoid mixed cereals, fish oils and vegetable soups the contents of which are composed of many items. Apparently foods consistently disliked or regurgitated should be avoided and the diet varied. Too early introduction of vegetables and fruits, some feel, is apt to encourage allergic disorders.

Signs and symptoms suggestive of an allergic disturbance are recurrence of head colds, itching, sneezing, coughing, wheezing, hoarseness, croup, abdominal pain, eczema, hives, excessive regurgitation, constant discomfort, excessive constipation, mucus in the stools or loose stools and sudden swelling. Respiratory disorders which are not contracted by others in the family suggests an allergic background.

In the treatment of allergic disorders, not the allergic condition alone, such as eczema, needs treatment but the infant with eczema. While symptomatic or palliative remedies are of some value, it is to be remembered that the disorder is probably due to some substances ingested or inhaled, and proper care must be exercised to minimize future sensitivity.

To avoid or at least to reduce the incidence of reactions from immunologic procedures, they should be given early and when the child is approximately 1 year of age the following procedures should have been completed: pertussis vaccine, diphtheria and tetanus toxoid, Schick test and vaccination. Such a course reduces the need of subsequent serums, which in allergic infants are not without potential danger.

After the patient reaches childhood it is much more difficult to find the etiologic factors. A more detailed investigation is necessary and more reliance has to be

placed on dermal and intradermal tests than is necessary in infancy. In addition to the signs and symptoms already mentioned, frequent sniffling, nasal itching, headaches, fatigue, eructation, "canker sores," fever blisters, colitis, circumoral pallor, subocular discolorations or edema, so-called sinus infections, night sweats and the like are found. In cases in which there is a persistent dislike for certain foods (especially if parents are not finicky and table manners are pleasant) or a craving for some foods, some information is available which at times proves to be of clinical value.

On physical examination the allergic child often shows pale, waterlogged inferior turbinates, overbite or teeth irregularities, a prominent nose, pinpoint papular lesions of the conjunctivae or small areas of excessive lymphoid tissue in the pharynx. He is frequently seen rubbing his nose to relieve itching, the so-called allergic salute. The child may be of the overactive type and appear fatigued occasionally and his span of attention may be short.

A comparative value of cutaneous and intracutaneous tests in the same hands will usually reveal vast superiority of the latter tests. Intracutaneous tests had best be preceded by cutaneous tests to avoid the possibility of unpleasant reactions. No set standard should be used for judging positive tests—each subject requires a somewhat different standard. Positive tests may reveal past, present or future sensitivity. They should be correlated etiologically by clinical history or vice versa. Avoidance of all definite positive foods or inhalants (so far as is possible and practicable) should be attempted; then after an interval of from six to twelve months, single foods should be reintroduced at the rate of one at intervals of three days. In such manner very few of the foods eliminated are still likely to give rise to clinical allergic disorders.

The exact number of allergens to be used for skin tests can hardly be foretold; approximately from 100 to 150 is the optimum amount. A large assortment should be utilized as is consistent with the age and cooperation of the patient in question plus influences such as environment, seasonal variation of symptoms and foods generally consumed by him. At times it is advisable as well as valuable to retest patients, especially when clinical results are not as good as desired. There is no accord as to how extracts are to be prepared or standardized; hence results are apt to vary even more so than is usual in medical circles. Since it takes a period ranging from days to several weeks to eliminate completely foods causing clinical allergy, elimination diets, I feel, are of limited value. Such diets are of more value when a complete allergic study is impossible or impracticable or after a thorough investigation has been of no value.

At times direct testing of the skin is impossible or impracticable; in such instances, approximately as good results may be obtained by passive transfer tests. The usual indications for such a procedure are when there is lack of cooperation, when it is difficult to do intracutaneous tests on infants or very young children, among those who have a generalized eczema or more or less constant urticaria, asthma or angioneurotic edema, and in those who have a marked dermographia.

Whereas avoidance might be preferable for clinical sensitivity to inhalants, such is not often possible or practicable, and specific antigens had best be given in an attempt to obtain a tolerance to those substances.

Leukopenic indexes are of questionable value among children, in whom there is normally a wide variation of the leukocyte count. The procedure is too slow and is painful to little children, and it is difficult to keep children quiet for an hour. The test is subject to too much personal error and is time consuming. The arbitrary standard of selecting a drop of 1,000 cells as significant of sensitivity is, at the best, open to question. It is obvious that a drop of 1,000 cells in a fasting count of 4,000 white cells is more significant than when the fasting count is 12,000 white cells. Moreover, if a food which previously has given trouble has been avoided for months, the reintroduction of it, if it is still a major cause of trouble, is apt to send the white count lower than when that food had been continuously eaten. When clinical observation and skin tests are misleading, leukopenic indexes apparently have their greatest place.

Removal of tonsils and adenoids for relief of allergic disorders will generally meet with failure. Likewise, surgical nasal procedures had best be avoided. Ionization of the nasal mucosa, frequent nasal packing or roentgen therapy of the sinuses is of little value in allergic rhinitis or sinusitis, as such treatment is directed to the result and not to the cause. Proper allergic care usually reduces the engorgement of the nasal mucosa, permits physiologic drainage and gives more breathing space. When tonsils and adenoids are to be removed, that procedure should be attempted during the season in which pollens are not prevalent, to avoid a subsequent pollen hay fever or asthma, which far too frequently seems to follow. Smears of the mucus or mucopurulent nasal drainage among allergic children usually show an eosinophilia. Such a finding per se should put one on one's guard when nasal procedures are contemplated.

Instructions to parents should be in writing to avoid misunderstanding. Foods apt to contain forbidden articles should be mentioned. Recipes are often needed when milk, egg and wheat sensitivity exists.

Transfusion among allergic children is not without some potential danger. Careful inquiry should be made into the donor's possible allergic background, and his blood should be taken just before a meal, if time permits. This reduces reactions to the donor's blood resulting from reagins in the donor's blood to which the recipient is clinically sensitive. Intradermal tests with the donor's blood is an added precaution.

When it is possible to modify the severity of a disease, as with measles, or possibly to immunize against one, as with pertussis, it should be considered, as those diseases are too frequently followed by asthma. Vaccination should be deferred among infants and children with eczema, as there is danger of a generalized vaccinia due to dissemination of the virus through the blood to the eczematous areas of the skin. Untreated eczema of infancy is apt to turn into asthma or recurrent bronchitis of childhood. Such is unfortunately often true of croup of infancy. Gastrointestinal upsets of infancy may become paroxysmal headaches or migraine later. Uncorrected recurrent allergic rhinitis at times becomes hay fever or asthma in later years. When there is definite or suspicious sensitivity to horse serum, serum of another animal should be used if possible.

No matter what the nature of the allergic disorder, one should not forget the importance of good health and habits. The allergic balance is apt to be better maintained when the physical and mental condition is good.

## CONCLUSION

The care of allergic children begins in utero. In view of the frequency of abatement of clinically allergic symptoms during pregnancy, mothers should be warned to abstain from or eat cautiously foods they know have previously given trouble. They should also be warned not to satisfy food cravings. Before the arrival of the infant its room should be clean and free from inhalant substances such as hairs, feathers and dust. Early allergic symptoms should be sought and mothers taught what to expect, and when the cause is found it should be eliminated. Preventive measures given early reduce reactions and need of subsequent serums. After a child becomes several years of age, it is more difficult to find the etiologic allergic factors. A detailed search by means of exhaustive history, scratch tests and the use of intradermal tests enable one generally to find the cause. Intradermal tests are far superior to scratch tests. By elimination and diet correction and at times through specific antigen reactions, it is usually possible to hyposensitize or completely relieve allergic disorders in childhood and probably reduce the incidence and severity of allergic disorders of adult life.

1601 Monument Avenue.

## ABSTRACT OF DISCUSSION

DR. GEORGE PINESS, Los Angeles: I question our ability to choose foods because of their being less potential possibilities as sensitizers; therefore I would suggest the following in the handling of the potentially allergic or allergic child from a dietary standpoint: I do not think doctors, or the parents of the children, are sufficiently alert or so food wise that they can determine which foods are less potential sensitizers. Therefore I suggest that the diet for the infant be diversified, that smaller quantities of a particular food be administered, with greater variety to choose from, and that the interval between the repetition of a suspected food be greater. As Dr. McGee suggested, a three-day interval between certain foods is perhaps a good one, although from practical experiments I am convinced that the greater the interval between successive feedings of the same food the better and the less possibility there will be of acquiring sensitivity to it. I would suggest that foods such as pablum, which contains fourteen or fifteen ingredients, be avoided as long as possible and that the food combinations used be simple and of single content if possible. In making a survey recently of about 1,000 histories at the Childrens Hospital, Los Angeles, I was surprised to find that my impressions of certain foods were erroneous in that those I suspected as being most frequent offenders proved to be otherwise. It is the general opinion of most pediatricians and allergists that wheat is perhaps the commonest offender. In the group mentioned it was fifty-fifth on the list. The most common food to give both clinical symptoms and cutaneous reactions was tomato. The most common cereal was barley. It gives one considerable to think about when one figures that elimination diets eliminate the foods that are thought to be common offenders and on specific evidence prove not to be. Foods and foods alone are not the commonest cause of allergy. It is just as common to find that inhalants and environmental allergens may cause any of the allergic conditions that were observed. Rowe in his paper yesterday discussing food allergy as a cause of bronchial asthma proved on his own charts that 40 per cent of his patients are sensitive to pollen and over 40 per cent to environmental proteins and that the general rule of multiple sensitivity acceptable to all of us occurred in his group as well. I want to emphasize the suggestions made by Dr. McGee concerning surgical procedures for the relief or alleviation of allergic symptoms. On the other hand one must not neglect to remove any pathologic condition that can be removed by surgical means, but the assumption that it will cure allergy is not justified. Dr. McGee expressed without doubt the opinion of most workers that the leukopenic index has little if any value from a practical or experimental standpoint in the field of allergy. This is confirmed in recent articles of Loveless, Brown and others.

DR. MARGARET M. NICHOLSON, Washington, D. C.: The point to bring out is that we happen to be treating an allergic child and not caring for the allergic state. A child may have cutaneous sensitiveness to certain factors and yet not be sensitive to them clinically. In Washington, the child of a man who is a food faddist was sensitive to carrots. Neither the father nor the mother nor the child had ever tasted carrots or any derivative of carrots. The child was taken out of the home and psychologically adjusted and never again had asthma. Depriving a child of foods essential to normal growth and development in pursuance of a theory prevalent at the time may damage him for life. I emphasize the point Dr. McGee brought out about the three days elapsing in the intervals between eating each new food by giving the mother a chart and she checks every new food, allowing three days before she repeats that food, and then repeats it three times at three day intervals. As to the vitamins, my eczematous patients have improved remarkably on very large doses of vitamin B. Of course, it may be that they have been on such rigid diets because they were sensitive to certain substances that they were markedly deficient in vitamin B at the time I obtained them. It is well known that among Negro families in the South certain children can eat tomatoes if they are picked from the vine but that if the tomatoes are allowed to stand a day or two before they are eaten, the children will have a rash or asthma. Recently at a meeting in Boston it was brought out that this has a great effect on the vitamin content, so I was wondering whether the old theory probably had truth in it. Concerning the endocrines, it seems that frequently I have seen exhibits of children who were endocrinologically affected following asthma, I think probably the result of the vitamin deficiency. The psychologic upset that these children have following any allergic state is one of the main factors. It makes them annoying citizens in later life because allergic children are spoiled and quite a problem in all the schools.

DR. JULIAN COHN, Los Angeles: I find in the practice of allergy that among the profession generally and in some cases among the pediatricians particularly the diagnosis of allergic states seems to go begging. I find that the inherited factors are not given much consideration. This is particularly true in cases of undiagnosed cough. Some parents, when asked specifically, prove to have some type of allergy, if it isn't any more than a nasal block or postnasal drip. Many parents who assert freedom from any allergy in the family, on being questioned more thoroughly, will acknowledge some form of allergy in the family. Their inherited traits will show that many of the parents and possibly the relatives eventually will acquire asthma, a wheezing particularly. It is also true that many of these children, with cutaneous manifestations in the flexure regions and around the neck, will acquire asthma some time later. I find that the scratch reaction isn't worth anything. My condemnation is not to be taken that it should be eliminated, but one should remember that the scratch test gives positive reactions in possibly no more than 25 or 30 per cent of cases while the intracutaneous method gives positive reactions in from 65 to 75 per cent of all cases. In some cases there is a lack of cooperation on the part of the parent. The parent is the greater problem permitting the patient to eat anything he desires. I agree with Dr. Piness on the interval allowed between additions of new foods. I usually insist on from seven to ten days before adding others.

DR. W. AMBROSE MCGEE, Richmond, Va.: With regard to the interval of three days, I believe that a number of pediatricians observe no interval at all. They start one food right after another, and especially is that true of vegetable soup, with which so many of them begin. I should have said that an interval of three days would be a minimal interval and that a longer one would be preferable. I also agree that inhalants are a much greater cause of trouble than has been thought in the past; even such conditions as eczema might be

due largely to inhalants, and to simply treat the food factor without the environmental factors would not produce results. An inhalant will cause just as much trouble as food and cause the same type of symptom as a food. I agree with Dr. Piness's list of foods that he has found in a study of 1,000 children. I think most of those are children of 2 and above. When I mentioned milk and egg as one of the main factors, I had reference to infants usually under 1 year of age. Cutaneous tests are not infallible but they give a working basis to start from. Skin tests do not determine whether one is allergic. Let me stress that again. It is the history. Egg yolk is not nearly so common a factor as egg white, but one does find egg yolk sensitive patients. When one has children on those rigid diets it is necessary to care for vitamins and minerals in the new diet. As to personality changes, one sees children who are spoiled and present other behavior problems clear up beautifully after one gets them straightened out from an allergic standpoint. I believe that nasal allergy is frequently overlooked and is usually referred to as the so-called postnasal drip or nervous cough. If the allergy is corrected, the cough usually disappears. I also agree that scratch tests are more or less worthless in comparison with the intracutaneous ones. Those who try to rely on results from scratch tests alone are going to keep patients from going to some one who really will study them completely. In reference to our chairman's comment about water, I think he is right and I would also like to add that since we get so much of our information from the animal kingdom, and animals do not seem to take milk after infancy, are we right in advocating a quart of milk daily for every child, provided, of course, minerals, vitamin and other needs are satisfied through other sources?

## Clinical Notes, Suggestions and New Instruments

### ARTIFICIAL CONCENTRATION OF TEST SERUMS IN BLOOD GROUPING

PAUL HOXWORTH, M.D., AND EARLE MAHONEY, M.D.
CINCINNATI

The advantages in speed and accuracy of the combined Vincent-Coca technic for the grouping and direct matching of blood prior to transfusion have been emphasized in a recent report from the Cincinnati General Hospital.[1] Since the adoption of this method as a routine we have relied successfully on one minute macroscopic grouping in more than 3,000 consecutive blood transfusions. However, the serums used during this time have excelled the requirements of Coca's grade I [2] (table 1).

The safety of rapid open macroscopic grouping depends entirely on the use of test serums of extremely high hemagglutinin titer. Donors whose serum meets these standards are rare, and finding them is accomplished only after considerable search.

Consequently a method for concentrating the hemagglutinins in serum is highly desirable. Artificial concentration by alternate freezing and thawing has been proposed by Terry.[3] The lyophile method of drying serum as reported by Flosdorf and Mudd [4] appeared to us as a possible method for accomplishing the same purpose. We have been able to dry serum by this method and redissolve the residue in less than the original volume. The resulting product was found to have a hemagglutinin titer greater than the unprocessed serum and to be suitable for use as test serum.

Dr. Mahoney is Fellow of the National Research Council.
From the Department of Surgery of the College of Medicine of the University of Cincinnati and the Cincinnati General Hospital.

1. Hoxworth, Paul, and Ames, Axel: Blood Grouping and Compatibility, J. A. M. A. 108:1234 (April 10) 1937.
2. Coca, A. F.: A Slide Method of Titrating Blood Grouping Sera, J. Lab. & Clin. Med. 16:405 (Jan.) 1931. Hoxworth.[1]
3. Terry, M. C.: High-Titer Blood Grouping Serum, Proc. Soc. Exper. Biol. & Med. 33:14 (Oct.) 1935.
4. Flosdorf, E. W., and Mudd, Stuart: Procedure and Apparatus for Preservation in "Lyophile" Form of Serum and Other Biological Substances, J. Immunol. 29:389 (Nov.) 1935.

#### TECHNIC

Under sterile precautions 200 cc. of anti-B serum was dried by the lyophile method. The solid was then completely dissolved in 50 cc. of sterile distilled water and the solution was found to contain active anti-B hemagglutinins when placed with known sensitive anti cells. Samples of the unprocessed and processed plasma were then compared for anti-B hemagglutinin potency according to the method of slide titration described by Coca.[2] The results of the titrations are given.

#### DATA

Serum which would agglutinate macroscopically an equal volume of anti cells in whole blood in twenty seconds was processed, resulting in a serum which under the same conditions agglutinated the same cells in four seconds (table 2). This indicates that the hemagglutinin titer of the serum was increased in inverse proportion to the volume. The processed serum was then rediluted to the original volume and the hemagglutinin potency was the same as that of the unprocessed serum. Similar results were obtained with this serum in various dilutions and with other serums, both as to retention of group specificity and as to the concentration of agglutinins. In most instances it was possible to obtain, within two minutes, complete solution of the dried product in one fifth of the original volume of the serum. Imperfect drying resulted in a gummy product which resisted solution, and the hemagglutinin activity of the supernatant liquid was markedly lowered or absent.

TABLE 1.—*Comparison of Agglutinin Titer of Serums Used at Cincinnati General Hospital with Grade I (Coca) Serum*

| Serum | Serum Dilution | Cell Dilution | Macroscopic Agglutination Time |
|---|---|---|---|
| Grade I (Coca) | 1-4 | 1-4 | 11 seconds |
| Serum at Cincinnati | Anti-A 1-10 | 1-4 | 5 seconds |
| General Hospital | Anti-B 1-10 | 1-4 | 5 seconds |

#### SUMMARY AND CONCLUSIONS

Rapid macroscopic methods for the grouping of blood prior to transfusion are desirable because of their speed and simplicity. This is especially true when combined with the Coca technic for direct matching. If these methods are to be used safely, unusually high titered test serums must be employed in order to detect clearly weak A and B cell factors. Serums of inadequate titer may be artificially concentrated by the lyophile method. This provides a more unlimited source of supply than has been previously available for use in open macroscopic methods for grouping.

TABLE 2.—*Comparison of Agglutinin Titer of Processed and Unprocessed Serum*

| Serum | Amount, Cc. | Anti Cells Whole Blood, Cc. | Macroscopic Agglutination Time |
|---|---|---|---|
| Unprocessed | 0.05 | 0.05 | 20 seconds |
| Processed (One fourth of original volume) | 0.05 | 0.05 | 4 seconds |
| Processed (Rediluted to original volume) | 0.05 | 0.05 | 20 seconds |

**Hemoglobin and Hemocyanin.**—Higher animals all have blood containing iron-bearing hemoglobin, to act as an oxygen carrier. Instead of hemoglobin some of the lower sea animals have hemocyanin, which is almost the same chemical composition except that copper has been substituted for the iron. The green chlorophyll of plants, which promotes the reactions of photosynthesis which make all life possible, has a chemical composition quite similar to our own hemoglobin, but magnesium has been substituted for iron in the molecule.—Furnas, C. C., and Furnas, S. M.: Man, Bread and Destiny, New York, Reynal & Hitchcock, 1937.

## Special Article

# VITAMIN C

### PHARMACOLOGY AND THERAPEUTICS

ARTHUR F. ABT, M.D.
AND
CHESTER J. FARMER, A.M.
CHICAGO

*This article and others recently published or to be published comprise a new series on the present status of our knowledge of the vitamins. They have been prepared under the general auspices of the Council on Pharmacy and Chemistry and the Council on Foods. The opinions expressed are those of the authors and not necessarily the opinions of either council. Reprints are not available but the articles will be published later in book form.*—ED.

Vitamin C is specifically involved in the prevention or treatment of scurvy. Since this factor was isolated, its structure determined and the pure substance synthesized, considerable advances in our knowledge of the physiology of vitamin C have been made and some evidence of the value of this substance in conditions other than scurvy has been developed. Exact knowledge of the pharmacologic action of vitamin C is still rather limited, but it is growing rapidly because of the development of chemical methods for estimating vitamin C in foods and body tissues and fluids. The present review is an attempt to summarize this knowledge as well as the present status of our knowledge of the therapeutic usefulness of vitamin C.

### AVAILABLE PREPARATIONS OF VITAMIN C

It must not be forgotten that vitamin C is an accessory food substance and that ordinarily foods are relied on for a supply of this essential factor. As described in the paper on sources of vitamin C,[1] there are some foods which are especially potent. Chief among these are the citrus fruit juices, which long have been used in the prevention and treatment of scurvy. Fresh orange juice contains on the average from about 40 to 60 mg. of vitamin C per hundred cubic centimeters. The daily requirements of an adult are considered to be about 25 mg. for the prevention of scurvy and more than that for normal requirements. The exact requirements for normal health are not known but nutritionists have estimated that a standard allowance for an adult would be from 600 to 1,200 international units, equivalent to from 30 to 60 mg. of vitamin C. Canned tomato juice is also a rich source of vitamin C, as are the canned citrus fruit juices.[2]

It is customary to give vitamin C to all babies early in life. This is usually administered in the form of fresh orange juice, beginning even as early as the third week of life with a teaspoonful and, if well tolerated, increasing gradually until the baby is taking about 2 ounces daily by the third month. On this basis the infant will be receiving up to about 25 mg. or more of vitamin C a day. Other sources of vitamin C may be substituted for the fresh orange juice and this substitution should be on the basis of the vitamin C content.

Synthetic preparations of crystalline vitamin C are now available. Ascorbic acid is freely soluble in water and may be administered orally in tablet form or dissolved in water. For parenteral use, either intramuscularly or intravenously, Fisher and Leake[3] have recommended that ascorbic acid be dissolved in sterile water and neutralized with one-half its weight of sodium bicarbonate immediately before injection. If this procedure is followed, the vitamin will not lose in potency and local reaction will be avoided.

Before the isolation of the crystalline vitamin, doses larger than 500 mg. daily (approximate content of 1 quart of orange juice) were impracticable. We have noted in some of our experimental work that certain persons will not tolerate even 1 pint of orange juice daily. Since the crystalline vitamin has become available, it may be used to supplement the dietary intake or to be given in large doses.

The crystalline vitamin has an indicated therapeutic value in infant feeding under certain conditions. There are some infants who are allergic to or intolerant to fruit juices and other foods rich in vitamin C. This intolerance or sensitivity is presumably due to the proteins of the juices or foods containing the natural vitamin, and in such cases the crystalline vitamin may be advantageously substituted. The substitution of the crystalline vitamin for the natural food sources may also have a therapeutic indication in certain acute and chronic gastrointestinal diseases in which adequate absorption of vitamin C from natural food sources is altered or interfered with.

In certain of the conditions to be discussed, relatively large doses of crystalline vitamin C are required to obtain therapeutic effects. Although the normal daily human requirements have been estimated to be from 15 to 40 mg. or even up to 60 mg.,[4] it is difficult to explain why certain therapeutic effects can be obtained only by administering doses of from ten to twenty-five times this amount. Our present state of knowledge is so limited that a precise statement of what constitutes proper dosage is not practicable. In New and Nonofficial Remedies it has been suggested that crystalline vitamin C be administered in quantities of 10 mg. for the prevention of infantile scurvy. "The therapeutic dose is about 30 mg. daily, although many physicians prefer to administer larger amounts to adults."[5]

One question raised with regard to the higher dosages that are possible with crystalline vitamin C is the possibility of toxicity. It is rather generally accepted that vitamin C is nontoxic when administered in moderate doses to the human being and excess amounts are excreted. Repeated doses of as much as from 1 to 6 Gm. have been administered orally and intravenously to adults, with no evidence of toxic action.[6] Friedman, McGoey and Ralli[7] in a study of vitamin C clearance have repeatedly obtained plasma concentrations ranging from 5 to 22 mg. per hundred cubic centimeters (normal values are from 0.7 to 1.5 mg.) with no evidence of toxicity. However, Schade[8] observed vagotonic

From the Northwestern University Medical School.

1. Bessey, Otto A.: Vitamin C: Methods of Assay and Dietary Sources, J. A. M. A. 111:1290 (Oct. 1) 1938.
2. The Vitamin C Content of Commercially Canned Tomato Juice and Other Fruit Juices as Determined by Chemical Titration: A Report of the Council on Foods, J. A. M. A. 110:650 (Feb. 26) 1938.
3. Fisher, B. H., and Leake, C. D.: The Parenteral Administration of Cevitamic Acid (Ascorbic Acid) Solution, J. A. M. A. 103:1356 (Nov. 17) 1934.
4. Smith, Sybil L.: Vitamin C Nutrition and Requirements, J. A. M. A., to be published.
5. New and Nonofficial Remedies, Chicago, American Medical Association, 1938, p. 472.
6. Personal clinical experiences.
7. Friedman, G. J.; McGoey, C., and Ralli, E. P.: Personal communication to the authors; abstract, Proc. Am. Physiol. Soc. Bull., 1938.
8. Schade, H. A.: Beitrag zur Frage des Einflusses von Vitamin C (l-Ascorbinsäure) auf Pigmentierungsvorgänge, Klin. Wchnschr. 14:60 (Jan. 12) 1935.

symptoms in growing children at the height of the vitamin C action (fatigue, exhaustion, slow pulse, increased intestinal peristalsis). Widenbauer[9] noted vagotonic symptoms such as dermographia, hyperemia, erythema, increased peristalsis and bradycardia in infants on maximum doses of vitamin C. These symptoms were not attributed to a hypervitaminosis but to drug sensitivity or idiosyncrasy to ascorbic acid. In the guinea pig Randoin[10] has noted that, if a scorbutic animal is given relatively large quantities of vitamin C, the animal may lose weight and the symptoms of scurvy reappear.

### FUNCTIONS AND PHARMACOLOGIC ACTIONS

The chief function assigned to vitamin C in the body is concerned with the formation of colloidal intercellular substances.[11] The intercellular substances which appear to be regulated by vitamin C are of mesenchymal origin —the collagen of all fibrous tissue structures, all non-epithelial cement substances, including the intercellular

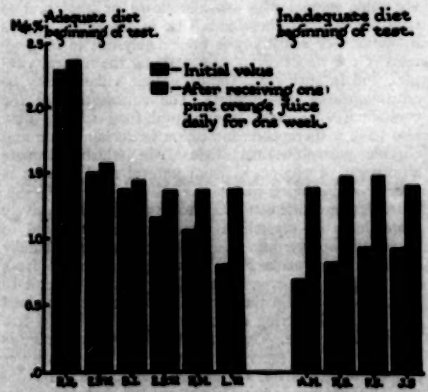


Chart 1.—Vitamin C content of the blood as influenced by diet: ascorbic acid values of young adults.

substance of the capillary wall, dentin, cartilage, and the matrices of bone. It has also been suggested that vitamin C may function as a respiratory catalyst, aiding cellular respiration by acting as a hydrogen transport. The theory suggesting this function has received support in relation to plant and vegetable life[12] but has not been proved for animal tissue.

It has been shown that man, the guinea pig and the primates are incapable of synthesizing vitamin C. In tissue slice experiments, Widenbauer and Korschorreckt[13] reported an increase in vitamin C, as measured by iodine titration, when slices of intestine from the mouse or rat, animals which are capable of synthesizing vitamin C, are incubated in a sterile dextrose-salt medium. When slices of liver, spleen, stomach or brain were used, no evidence of vitamin C formation could be found. These authors concluded that animals which do not require a dietary supply of vitamin C synthesize ascorbic acid from dextrose in the intestine.

*Occurrence in Body Fluids.*—Vitamin C has been found in the body fluids. It is excreted in the urine, the amounts varying with the dietary intake.[14] The level of vitamin C in the blood plasma also varies directly with the dietary intake[15] (chart 1). The methods for chemical assay of the blood plasma have been given in another article of the series.[15a] In our opinion the recommendation that potassium cyanide be used as a stabilizer of ascorbic acid is unfortunate. We and others[15b] have recently shown that potassium cyanide not only does not prevent the loss of ascorbic acid from the blood plasma, but its use may also give erroneous results of considerable magnitude. The use of potassium cyanide in carrying out the method for determining ascorbic acid in blood should be discontinued. Low blood plasma values found in man have been associated with active scurvy.[16] In the scorbutic guinea pig the lowest plasma values have occurred just before death.[17] According to Borsook,[18] practically all the ascorbic acid in plasma and serum is in the reduced state.

Plaut and Bülow[19] have observed a direct relationship between the vitamin C content of the cerebrospinal fluid and the dietary intake, which corresponds to the observations on blood plasma. Stuteville[20] noted the presence of vitamin C in saliva. Abt, Farmer and Epstein[21] measured the ascorbic acid content of saliva obtained from students, before and after diets supplemented by vitamin C. No definite relationship could be established between the dietary intake and the salivary content. The salivary level was also found to be independent of the level in the blood. According to Zimmet and Dubois-Ferrière,[22] the concentration of vitamin C in the saliva of children increased progressively from a level of 0.04 mg. per hundred cubic centimeters at 4 years of age to 0.11 mg. per hundred cubic centimeters at 16 years.

9. Widenbauer, F.: Toxische Nebenwirkungen von Ascorbinsäure—C Hypervitaminose? Klin. Wchnschr. 15:1158 (Aug. 15) 1936.

10. Randoin, G. L.: On the Necessity for a Biological Supervision of Food with Special Reference to Its Vitamin Content, Quart. Bull. Health Organ., League of Nations 5:493 (Sept.) 1936.

11. Wolbach, S. B.: Pathologic Changes Resulting from Vitamin Deficiency, J. A. M. A. 108:7 (Jan. 2) 1937.

12. Szent-Györgyi, Albert: On the Function of Hexuronic Acid in the Respiration of the Cabbage Leaf, J. Biol. Chem. 90:385 (Jan.) 1931.

13. Widenbauer, F., and Korschorreckt, E.: Ueber die Bildung von Vitamin C mit überlebenden Gewebsmilien im Rongenglas, Biochem. Ztschr. 292:309, 1937.

14. Harris, L. J.; Ray, S. N., and Ward, Alfred: The Excretion of Vitamin C in Human Urine and Its Dependence on the Dietary Intake, Biochem. J. 27:2011 (Nov.) 1933. Harris, L. J., and Ray, S. N.: Diagnosis of Vitamin C Subnutrition by Urine Analysis, with Note on Anticorbutic Value of Human Milk, Lancet 1:71 (Jan. 12) 1935. von Euler, Hans, and Klussmann, E.: Physiologische Versuch über Vitamin C (Ascorbinsäure) und Reduktone, Ztschr. f. physiol. Chem. 217:167 (April) 1933. Johnson and Zilva.[15a]

15. Farmer, C. J., and Abt, A. F.: Ascorbic Acid Content of Blood, Proc. Soc. Exper. Biol. & Med. 29:1625 (June) 1935; Determination of Reduced Ascorbic Acid in Small Amounts of Blood, ibid. 34:146 (March) 1936. Greenberg, L. D.; Rinehart, J. F., and Phatak, N. M.: Studies on Reduced Ascorbic Acid Content of the Blood Plasma, ibid. 35:135 (Oct.) 1936.

15a. Bessey, Otto A.: Vitamin C: Methods of Assay and Dietary Sources, J. A. M. A. 111:1290 (Oct. 1) 1938.

15b. Farmer, C. J., and Abt, A. F.: The Invalidation of Plasma Ascorbic Acid Values by Use of Potassium Cyanide, Proc. Soc. Exper. Biol. & Med. 38:399 (April) 1938. Friedman, Gerald J.; Rubin, Saul H., and Kean, Walter: Effect of Addition of KCN to Whole Blood on Indophenol-Reducing Power of Plasma, ibid. 38:358 (April) 1938. Mindlin, R. L.: The Relation Between Plasma Ascorbic Acid Concentration and Diet in the Newborn Infant, J. Pediat. 12:309-313 (Sept.) 1938.

16. Abt, A. F., and Epstein, I. M.: Cevitamic Acid in the Treatment of Infantile Scurvy, J. A. M. A. 104:634 (Feb. 23) 1935.

17. Abt, A. F.: Cevitamic Acid of the Blood Plasma, Am. J. Dis. Child. 54:682 (Sept.) 1937.

18. Borsook, Henry; Davenport, H. W.; Jeffreys, C. E. P., and Warner, R. C. P.: Oxidation of Ascorbic Acid, J. Biol. Chem. 117:237 (Jan.) 1937.

19. Plaut, F., and Bülow, M.: Weitere untersuchungen über das C-Vitamin im Gehirn und im Liquor cerebrospinalis, Ztschr. f. d. ges. Neurol. u. Psychiat. 153:84, 1935.

20. Stuteville, O. H.: Presence of Vitamin C in Saliva, Proc. Soc. Exper. Biol. & Med. 32:1454 (June) 1935.

21. Abt, A. F.; Farmer, C. J., and Epstein, I. M.: Normal Cevitamic (Ascorbic) Acid Determinations in Blood Plasma and Their Relationship to Capillary Resistance, J. Pediat. 9:1 (Jan.) 1936.

22. Zimmet, D., and Dubois-Ferrière, H.: Les variations du pouvoir reducteur (vitamin C) de la salive chez l'homme selon l'age, Comptr. rend. Soc. de biol. 124:103, 1937.

The vitamin C content of sweat,[23] aqueous humor [24] and gastric juice [25] has been determined. A study of the occurrence of vitamin C in the feces has been made in our laboratory.[26] In the normal individual not over 6 to 10 mg. daily are excreted, even with oral feeding of large amounts. Under abnormal conditions (diarrhea, colitis and the like) the amount depends largely on the number and type of stools. Ishibashi [27] has reported studies on the vitamin C content of the feces of infants. According to him, peroral administration of the vitamin produced no fecal rise.

*Absorption and Excretion.*—Vitamin C appears to be selectively absorbed by the tissues of the intestinal tract,[28] principally the small intestine. Klodt [29] believes that bile may aid absorption. In achlorhydria, blood plasma levels are usually lower than normal. This may be caused by decreased absorption of active vitamin C from the intestine, which in turn is caused by a lessened acidity of the intestinal contents or by a changed bacterial flora. In support of the latter view Kendall and Chinn [30] have shown that ascorbic acid is destroyed by certain bacteria isolated from stomach and intestinal contents of achlorhydric patients. Further evidence of the loss of vitamin C activity prior to absorption has been afforded by the observation of Wilder and Wilbur [31] that variable amounts of vitamin C are lost in the stool or destroyed in the gastrointestinal tract even under normal conditions. Hou [32] found that ascorbic acid administered by subcutaneous injection was twice as effective as that given by mouth in the protection of guinea pigs against scurvy. He has suggested as the probable explanation that part of the ascorbic acid administered orally is lost in the gastrointestinal tract. Until definite information is available to the contrary, it must be assumed that not only are there individual variations in absorption of vitamin C from the intestinal tract but also under certain conditions the absorption may be definitely abnormal.

After absorption vitamin C may be detected in increased quantities in the blood plasma, by which it is transported to the various tissues of the body. Whether a storage of vitamin C occurs in the animal body is still a debatable question.[33] This is indicated by the necessity for a continuous food supply in species incapable of synthesizing vitamin C. Because of the ease with which vitamin C can be determined chemically, many studies have been made concerning its metabolism. Large doses of the vitamin have been administered and measurements made of the amounts excreted in the urine. Johnson and Zilva [34] consider that "saturation" of the tissues with vitamin C has been reached when the ingestion of a certain amount of vitamin C is roughly equaled by the daily excretion of the vitamin in the urine. Succeeding investigators have attempted to determine the saturation of the organism by oral or intravenous administration of test doses of ascorbic acid and subsequent measurement of its excretion in the urine. The majority of investigators employing urinary excretion tests have failed to recognize the possibility that absorption from the intestinal tract may not be complete.[35] Further, they have arbitrarily stated that various amounts ranging from 30 to 75 per cent of the test dose are excreted on reaching "a state of saturation." If subjects on a previous minimal vitamin C diet require a total of from 2,000 to 3,000 mg. of ascorbic acid before appreciable amounts are excreted in the urine, must it be assumed that the total amount of vitamin administered found its way to the tissues? It should be obvious that, before quantitative statements are derived, consideration must be given to questions of destruction in and absorption from the intestinal tract, and excretion by way of the feces.

We have repeatedly observed that, on the oral administration of large quantities of vitamin C, only small amounts are excreted in the urine, while a steady rise in plasma level occurs. If the oral ingestion is continued for a sufficient period, a point of plasma elevation will be attained, following which a rapid urinary excretion of a large part of the ingested ascorbic acid occurs. We believe that the plasma level at which this quantitative urinary excretion occurs shows considerable individual variation.

Everson and Daniels [36] state that ascorbic acid metabolism may be compared with nitrogen metabolism in that the urinary excretion of vitamin C is of both endogenous and exogenous origin. Hawley and others [37] report that the amount of vitamin C excreted in the urine may vary according to the acid-alkali content of the diet, a highly alkaline urine having lower amounts than a highly acid urine. Daniels [38] reports that therapeutic doses of acetylsalicylic acid increase the excretion of vitamin C in the urine of children, while Youmans [39] states that it does not increase or decrease excretion of vitamin C in the urine of adults. It has been reported by Ahmad [40] that diets high in protein and fat cause an increased urinary excretion of vitamin C. On the other hand, Heinemann [41] noted that the total reducing power of the urine varies directly with the protein intake, while the vitamin C excretion remains uninfluenced.

*Diuretic Effect.*—Abbasy [42] has noted that, following the administration of a test dose (700 mg. of ascorbic acid to 10 stone, 140 pounds, 63.5 Kg. of body weight), the volume of urine, as well as the excretion of vitamin

23. Cornbleet, Theodore; Klein, R. L., and Pace, E. R.: Vitamin C Content of Sweat, Arch. Dermat. & Syph. 34: 253 (Aug.) 1936.
24. Rosner, Lawrence, and Bellows, John: Ascorbic Acid Oxidase in Determining Vitamin C in Lens and Aqueous Humor, Proc. Soc. Exper. Biol. & Med. 34: 493 (Mar.) 1936. Boehler, W.: Blutstrahlsalben im Auge und Vitamin C, Arch. f. Augenh. 106: 691, 1936.
25. Peters, G. A., and Martin, H. R.: Ascorbic Acid in Gastric Juice, Proc. Soc. Exper. Biol. & Med. 36: 76 (Feb.) 1937.
26. Farmer, C. J., and Chinn, Herman: Unpublished data.
27. Ishihashi, T.: Vitamin C of the Urine and Feces of Newly Born Infants, Acta paediat., Japan. 42: 187 (Feb.) 1937.
28. Zilva, S. S.: Ascorbic Acid Content of Intestine of Guinea Pig, Biochem. J. 29: 100 (Nov.) 1935.
29. Klodt, W.: Ueber den Einfluss der Galle auf die Vitamin C Resorption, Med. Welt. 10: 477 (April) 1936.
30. Kendall, A. I., and Chinn, Herman: A Method for Isolation of Ascorbic Acid Fermenting Bacteria, Proc. Soc. Exper. Biol. & Med. 38: 8 (Feb.) 1938; Decomposition of Ascorbic Acid by Certain Bacteria, J. Infect. Dis. 62: 330 (May-June) 1938.
31. Wilder, R. M., and Wilbur, D. L.: Diseases of Metabolism and Nutrition, Arch. Int. Med. 59: 512 (March) 1937.
32. Hou, H. C.: Comparison of Oral and Subcutaneous Administration of Protective Doses of Ascorbic Acid (Vitamin C), Proc. Soc. Exper. Biol. & Med. 32: 1391 (June) 1935.
33. Zilva, S. S.: Vitamin C Requirements of the Guinea Pig, Biochem. J. 30: 1419 (Aug.) 1936.
34. Johnson, S. W., and Zilva, S. S.: The Urinary Excretion of Ascorbic Acid and Dehydroascorbic Acids in Man, Biochem. J. 30: 1393 (No. 4) 1936.
35. Storage of Vitamin C, editorial, J. A. M. A. 108: 395 (Jan. 30) 1937.
36. Everson, G. J., and Daniels, A. L.: Vitamin C Studies with Children of Preschool Age, Nutrition 10: 13 (July) 1936.
37. Hawley, E. E.; Fraser, J. P.; Button, L. L., and Stephens, D. J.: Effect of the Administration of Sodium Bicarbonate and of Ammonium Chloride on the Amount of Ascorbic Acid Found in the Urine, Nutrition 13: 215 (Aug.) 1936.
38. Daniels, Amy L., and Everson, Gladys J.: Influence of Acetylsalicylic Acid (Aspirin) on Urinary Excretion of Ascorbic Acid, Proc. Soc. Exper. Biol. & Med. 33: 20 (Oct.) 1935.
39. Youmans, J. B.; Corlette, M. B.; Frank, Helen, and Corlette, Mildred: Failure of Acetylsalicylic Acid to Affect Excretion of Ascorbic Acid (Vitamin C) in Urine, Proc. Soc. Exper. Biol. & Med. 36: 73 (Feb.) 1937.
40. Ahmad, Bashir: Observations on Excretion of Vitamin C in Human Urine, Biochem. J. 30: 11 (Jan.) 1936.
41. Heinemann, Martin: On Relation Between Diet and Urinary Output of Thiocullate and Ascorbic Acid; Human Requirements for Vitamin C, Biochem. J. 30: 2299 (Dec.) 1936.
42. Abbasy, M. A.: The Diuretic Action of Vitamin C, Biochem. J. 31: 339 (Feb.) 1937.

C in the urine, showed a definite rise. He therefore attributed a diuretic action to the vitamin. As a result of an extended study of the urinary output of nine patients with cardiac disease, Evans [43] states that vitamin C was found to induce a greater diuresis than digitalis but less than theobromine, theobromine with sodium salicylate, and ammonium chloride.

*Blood Pressure.*—It was noted by Kasahara and Kawamura [44] that guinea pigs showed a rise in blood pressure when injected with 100 mg. per kilogram or greater doses of ascorbic acid and that monkeys showed a rise in blood pressure starting with injections of 40 mg. per kilogram and a greater rise with doses of from 100 to 200 mg. per kilogram. The authors conclude that the blood pressure rises in monkeys and guinea pigs following injections only of large amounts of ascorbic acid.

*Capillary Action.*—While it has been shown histologically that vitamin C regulates the intercellular substance of the capillary wall, a clear relationship between capillary resistance of the skin and dietary intake of vitamin C has not been definitely established.[45] Göthlin [46] has recently attempted to correlate capillary resistance measured by his positive pressure method with the ascorbic acid content of blood. He found increased capillary fragility in individuals with blood levels of 1 mg. per liter or less. In more than twenty cases of both infantile and adult scurvy observed by us, we have never obtained such low blood values.

*Effect of Anesthesia.*—According to Bowman and Muntwyler,[47] urinary excretion of vitamin C is increased following ether anesthesia in the dog, rat and guinea pig. The ascorbic acid content of the kidneys, liver, adrenals and spleen was found to be lessened after anesthesia. Bersin and his co-workers [48] found that excretion of ascorbic acid was diminished in the urine following ether and chloroform anesthesia in guinea pigs, on administration of a test dose of vitamin C intravenously.

### RELATION OF VITAMIN C TO SCURVY

Scurvy is a disease for which vitamin C is the sole therapeutic agent. The specificity of vitamin C in scurvy was demonstrated long before the isolation of the vitamin and, as soon as the vitamin was available as a pure chemical substance, it was successfully used both clinically and experimentally in the treatment of scurvy. According to Finkle,[49] a low body level of vitamin C is etiologic for no other disease than scurvy, with the possible exception of lupus erythematosus. As has been previously stated, the blood plasma levels are extremely low in human scurvy. Abt,[50] in reporting his early studies on human scurvy, showed that the dietary history and clinical signs and symptoms parallel the low blood plasma values and that the plasma content shows a rapid rise in a healing scurvy. With the aid of the micromethod described by us, tolerance tests were made on patients recovering from scurvy, the ascorbic acid content of the plasma being determined hourly and curves plotted. The initial level rises slightly but usually returns to a low level.[17] As the patient continues on a high vitamin C intake, fasting blood levels on successive days attain higher values. Tolerance tests performed at these times by the oral administration of 10 mg. of ascorbic acid per kilogram of body weight show, with fair uniformity, a higher value at the peak of each succeeding curve. The peak is usually reached by the second hour, and the rise (difference between the initial fasting level and the value attained at the peak) increases until a state is attained in which the body promptly excretes the major part of the ingested ascorbic acid.

Ascorbic acid may be given intramuscularly or intravenously for the cure of scurvy when nausea, emesis or extreme prostration prevents its oral administration. It is interesting to note that Hess and Unger [51] in 1918 administered neutralized orange juice intravenously to three patients for whom oral administration was impossible.

Jackson and Park [52] have reported a case of congenital scurvy. By determining the vitamin C content of the blood obtained simultaneously from the cord of the infant and the vein of the mother immediately after delivery, Abt, Farmer and Epstein [21] found practically identical values from the two sources. From these observations it may be concluded that the fetus is dependent for its source of vitamin C on the maternal dietary. If the vitamin intake of the mother is extremely low during pregnancy, congenital scurvy may consequently result.

Goettsch [53] has noted in treating infantile scurvy that a single massive dose of vitamin C permits the healing of the scurvy as effectively as the same amount of vitamin in divided doses. Observing calcification of subperiosteal hematomas, she noted that healing commenced as early as the forty-eighth hour after the intravenous injection of the large doses of vitamin. Aub [54] reports that vitamin C is a factor in calcium deposition in the bones. Its addition to a scorbutic diet causes a rapid deposition of calcium at the epiphysial ends of bones and in trabeculae. The effect is probably due to the necessity of adequate amounts of vitamin C for normal production of the organic matrix in which the lime salts are deposited.

Hess [55] has noted the development of scurvy in infants on a diet which contained sufficient vitamin to be ordinarily antiscorbutic. These infants recovered when given larger amounts of vitamin C orally. Hess felt that the development of scurvy in these cases was due to a failure of absorption of the ingested vitamin. Hagmann [56] reported that scurvy developed in a 2½ months old infant receiving 4 drachms (15 cc.) of orange juice daily. Large doses of vitamin C taken

43. Evans, William: Vitamin C in Heart Failure, Lancet 1:308 (Feb. 5) 1938.
44. Kasahara, M., and Kawamura, R.: Ueber den Einfluss der l-Ascorbinsäure auf den Blutdruck, Klin. Wchnschr. 16:1543 (Oct.) 1937.
45. Abt, Farmer and Epstein.[21] Wilder and Wilber.[31] Abbasy.[42]
46. Göthlin, G. F.: When Is Capillary Fragility a Sign of Vitamin C Subnutrition in Man? Lancet 2:703 (Sept. 18) 1937; Acta paediat. 20:71, 1937.
47. Bowman, D. E., and Muntwyler, E.: Further Experiments upon the Excretion of Ascorbic Acid in the Urine Following Ether Anesthesia, J. Biol. Chem. 116:114, 1936; Ascorbic Acid Content of Tissue Following Ether Anesthesia, Proc. Soc. Exper. Biol. & Med. 35:557 (Jan.) 1937.
48. Bersin, T.; Lauber, H. J., and Nafziger, H.: Der Einfluss der Narkose und Operation auf den Vitamin C Haushalt, Klin. Wchnschr. 16:1272 (Sept. 11) 1937.
49. Finkle, Philip: Vitamin C Saturation Levels in Body in Normal Subjects and in Various Pathological Conditions, J. Clin. Investigation 16:587 (July) 1937.
50. Abt, A. F.: Newer Knowledge of Vitamin C, Radiol. Rev. & Mississippi Valley M. J. 59:106 (May) 1937.
51. Hess, A. F., and Unger, L. J.: Experiments on Antiscorbutics; Report of an Antiscorbutic for Intravenous Use, Proc. Soc. Exper. Biol. & Med. 15:141 (May) 1918.
52. Jackson, Deborah, and Park, E. A.: Congenital Scurvy: Case Report, J. Pediat. 7:741 (Dec.) 1935.
53. Goettsch, Elvira: Treatment of Infantile Scurvy with Cevitamic Acid, Am. J. Dis. Child. 48:1441 (June) 1935.
54. Aub, J. C.: The Use of Calcium and the Choice of a Calcium Salt, J. A. M. A. 109:1276 (Oct. 16) 1937.
55. Hess, A. F.: Infantile Scurvy, in System of Pediatrics (J. A. Abt, Editor), Philadelphia, W. B. Saunders Company, 1923, vol. II, chapter 30, p. 849.
56. Hagmann, E. A.: Active Scurvy in an Infant Receiving Orange Juice, J. Pediat. 11:480 (Oct.) 1937.

orally failed to cure the scurvy, while vitamin C given intravenously caused an effective therapeutic response. Hagmann attributes the failure of the orally administered vitamin to effect a cure to a temporary faulty absorption from the gastrointestinal tract.

It has been noted that the urinary excretion of vitamin C in scurvy is low. Schultzer [57] has recently reported an average daily excretion of 11 mg. in the urine of a scorbutic patient before treatment. After daily intravenous injections of 40 mg. of the crystalline vitamin, the twenty-four hour urinary excretion rose to 16 mg. in the second week and to 26 mg. in the fourth week. Schultzer points out that on the basis of earlier experience the oral administration of 15 mg. of vitamin C daily was considered an adequate protective dose. Since a daily intravenous injection of 40 mg. of the vitamin was found to be an adequate curative dose, he suggests that the daily human requirement may be less than 40 mg. It has been [58] pointed out that, in the guinea pig, parenterally administered vitamin C is approximately twice as effective as a similar dose given orally.

Zilva,[23] employing the urinary excretion tests in experimental animals, casts doubt on the nature of this latent condition.

In our work we have repeatedly pointed out that fasting blood plasma levels parallel the vitamin C intake. In healthy individuals on what is considered an adequate vitamin C intake the blood plasma value will be 0.7 mg. per hundred cubic centimeters or above. Blood plasma values below 0.7 mg. per hundred cubic centimeters are subnormal or at least suboptimal. Active scurvy may occur with values ranging up to 0.4 to 0.5 mg. per hundred cubic centimeters (chart 2). Most authors reporting on blood plasma determinations are in close agreement with these figures with the exception of Ingalls,[60] whose figures are very low: from 0.15 to 0.30 mg. per hundred cubic centimeters of blood plasma in asymptomatic scurvy and from 0 to 0.15 mg. in active scurvy. The low values obtained by this author may be due to the fact that potassium cyanide [16b] was added to the blood, which was in some cases permitted to stand instead of being immediately deproteinized with metaphosphoric acid and titrated with 2:6 dichlorophenolindophenol. It remains for future investigation to prove or disprove the existence of a latent or prescorbutic state. With respect to the development of human scurvy, it should be emphasized that scurvy may surreptitiously develop in patients under treatment for other conditions, if adequate protective vitamin C content of the diet has been overlooked.

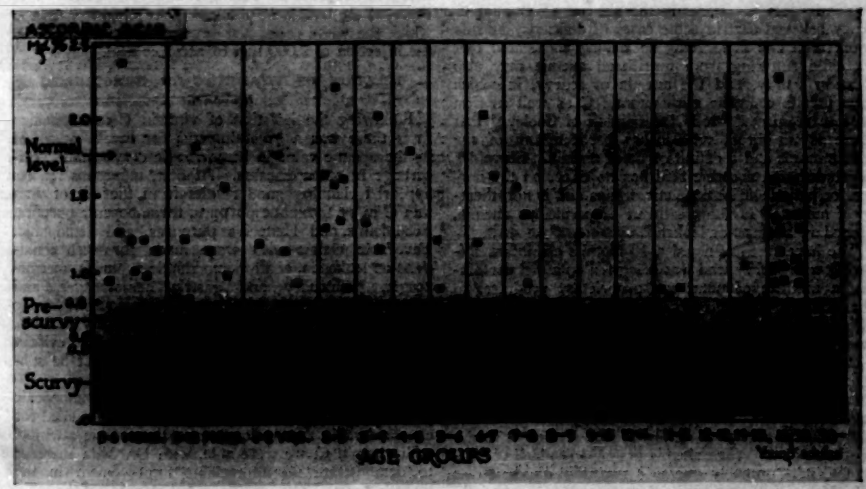


Chart 2.—Range of blood values for different age groups on adequate and subnormal diets, and in patents with scurvy.

## LATENT SCURVY

The question of a prescorbutic state or latent scurvy was first emphasized by Hess [59] in 1917. It was his contention that this state might be analogous to latent tetany. Hess and succeeding observers attempted to demonstrate this condition by the use of various tests for capillary fragility in the skin. Since the chemical isolation of the vitamin, various observers have attempted, through urinary excretion tests, to demonstrate this condition. As we have previously stated,

## ANEMIA AND VITAMIN C

Mettier, Minot and Townsend [61] reported that anemia is commonly found in adults with a vitamin C deficiency. They believe that vitamin C can have a

57. Schultzer, P.: Saturation of a Scurvy Patient with Small Doses of Ascorbic Acid, Biochem. J. 31:1934 (Nov.) 1937. Abt, A. F., and Farmer, C. J.: Exhibit on Vitamin C, Kansas City Session A. M. A., May 1936.

58. Hou,[58] Wright, I. S.; Lillienfeld, Alfred, and MacLenathen, Elizabeth: Determination of Vitamin C Saturation, Arch. Int. Med. 60:264 (Aug.) 1937.

59. Hess, A. F.: Subacute and Latent Infantile Scurvy; The Cardiorespiratory Syndrome (A New Sign), J. A. M. A. 68:235 (Jan. 27) 1917.

60. Ingalls, T. H.: Studies on Urinary Excretion and Blood Concentration of Ascorbic Acid in Infantile Scurvy, J. Pediat. 10:577 (May) 1937.

61. Mettier, S. R.; Minot, G. R., and Townsend, W. C.: Scurvy in Adults, Especially Effect of Food Rich in Vitamin C on Blood Formation, J. A. M. A. 95:1089 (Oct. 11) 1930.

specific effect on erythropoiesis when there has been a chronic lack of this vitamin. Anemia is more frequently associated with scurvy in the adult than in the infant, judging from clinical reports. Alfred Hess [62] noted that anemia was not constantly associated with infantile scurvy; in fact, in some of his scorbutic infants he reported a polycythemia. Rohmer and Bindschedler [63] reviewed the literature, noted the disagreement of the various authors on the association of anemia with infantile scurvy, and concluded that anemia is not an essential symptom of vitamin C deficiency. Hans Aron [64] also reported that anemia is not always associated with scurvy and that when it occurs it is not due to loss of blood, as was formerly believed. He stated also that in many instances it is difficult to determine whether one is dealing with a scurvy accompanied by anemia or an alimentary anemia complicated by scurvy. Parsons and Hawksley [65] suggested that hematopoiesis does not occur in the absence of vitamin C. They believed that in some cases of deficiency anemia more than one factor may be lacking and stated that "a child suffering from nutritional anemia may also develop scurvy, and the anemia of scurvy, in which case for its complete cure vitamin C as well as iron will be required." It is the opinion of Cooley [66] that there is no direct relationship between any of the avitaminoses and a definite type of anemia. Gingold [67] concluded that ascorbic acid has no effect on the normal or pathologic hemopoietic organs and is not, therefore, indicated in the treatment of pernicious anemia, secondary anemias or leukemias.

We have recently noted a 10 months old infant suffering with scurvy who was being fed on a diet containing a mixture of numerous proprietary products, so that the diet was high in calcium, iron and vitamins A, $B_1$ and D; the diet lacked only vitamin C. The infant was of a ruddy complexion, the red blood count was 4,800,000 and the hemoglobin 75 per cent (Sahli). The conditions in the case corresponded to our experimental experience with young guinea pigs, namely that anemia does not develop either clinically or experimentally when an adequate supply of iron is present in the scorbutic diet. When anemia accompanies lack of vitamin C it is probably due to a generally deficient diet in which substances other than vitamin C, especially iron, have been lacking. An accompanying infection may be a causative factor in the production of such anemia. While it is felt by some that the anemia of vitamin C deficiency may be one of commission, the result of a dysfunctioning of the red blood cell-forming elements, it is probably more often a condition produced by omission, namely of iron, in the generally deficient diet.

Heilmeyer [68] injected iron ascorbate intravenously in patients suffering from secondary anemia and noted good results, especially in those patients in whom oral administration of iron was interfered with by metabolic disturbances. He further administered iron ascorbate orally and noted a better absorption with this preparation than with other iron products. He was able to obtain a full iron effect with doses of from 300 to 600 mg. daily. Glanzmann [69] has recommended iron ascorbate in the treatment of infantile anemia of the alimentary type. Pijoan [70] later made a similar report. It is evident that the need of a preparation such as iron ascorbate is limited.

### LEUKEMIA AND VITAMIN C

Stephens and Hawley [71] have noted that the vitamin C content of leukocytes is considerably greater than that of the plasma or erythrocytes. They noted an extremely high value for the ascorbic acid of the whole blood in leukemias. Eufinger and Gaehtgens [72] have reported the treatment of a case of myeloid leukemia in which the white count was brought back to normal by the injection of 2,000 mg. of ascorbic acid.

### RELATION OF VITAMIN C TO HEMORRHAGIC DISEASES

Following the isolation of vitamin C in crystalline form there was a great impetus for investigations of its therapeutic value in hemorrhagic diseases and hemorrhage in other diseases. At first, numerous reports appeared claiming good results from the use of vitamin C in symptomatic purpura, thrombopenic purpura, Schönlein's and Henoch's purpuras, and hemophilia. Favorable claims also were made for such conditions as leukemia, acute hemorrhagic nephritis, metrorrhagia, pulmonary and gastric hemorrhages, and intestinal hemorrhage in ulcerative colitis and following perforations in typhoid. These were usually accounts of success in isolated cases.[73] It soon became evident that these early enthusiastic claims could not be substantiated.

In examining several patients with thrombopenic purpura whose blood components had been studied for a considerable time prior to the therapeutic attempts with vitamin C, we were able, with Dr. Mila Pierce,[74] to demonstrate no appreciable improvement in the thrombopenia. The capillary resistance of the skin remained abnormally low after the administration of large doses of vitamin C both orally and intravenously. Several investigators [75] in this country have similarly been unable to report beneficial effects after treatment with vitamin C in cases of true thrombopenic purpura and hemophilia.

62. Hess, A. F.: Scurvy, Past and Present, Philadelphia, J. B. Lippincott Company, 1920.

63. Rohmer, P., and Bindschedler, J. J.: L'anémie préscorbutique du nourrisson, Acta. pediat. 18: 399 (June) 1932.

64. Aron, Hans: Die Nahrungsschaden des Kindes, Berlin and Vienna, Urban und Schwarzenberg, 1928, p. 103.

65. Parsons, L. G., and Hawksley, J. C.: Studies in Anemias of Infancy and Early Childhood; Anhematopoietic Anemias (Deficiency Diseases of Erythron); Nutritional Anemia and Anemias of Prematurity, Scurvy and Celiac Disease, Arch. Dis. Childhood 8: 117 (April) 1933.

66. Cooley, Thomas B.: Practice of Pediatrics, Joseph Brennemann, Editor, Hagerstown, Md., W. F. Prior Company, 1937, vol. III, chapter 16, p. 9.

67. Gingold, N.: The Action of Ascorbic Acid (Vitamin C) on the Hemopoietic Apparatus Under Normal and Pathologic Conditions (Exclusive of Hemorrhagic States), Sang 11: 392, 1937.

68. Heilmeyer, L.: Die Behandlung eisenmangelischer Anämien mit Ascorbinsauren Eisen, Deutsches Arch. f. klin. med. 179: 216 (Sept.) 1936.

69. Glanzmann, E.: Zur Behandlung der Kinderanamien mit ascorbinsauren Eisen, Schweiz. Med. Wchnschr. 67: 436 (May 15) 1937.

70. Pijoan, M.: Antiscorbutic Properties of a Salt of Iron and Ascorbic Acid, Science 86: 80 (July 23) 1937.

71. Stephens, D. J., and Hawley, E. E.: Partition of Reduced Ascorbic Acid in Blood, J. Biol. Chem. 118: 653 (Oct.) 1936.

72. Eufinger, H., and Gaehtgens, G.: Ueber die Einwirkung des Vitamin C auf das Pathologisch veränderte weisse Bluthild, Klin. Wchnschr. 15: 150 (Feb. 1) 1936.

73. Boger, A., and Schröder, H.: Ueber die Stillung schwerster Blutungen bei allen Formen der hemorrhagischen Diathese und der Hemophilie durch parenterale Zufuhr von C-Vitamin, München. med. Wchnschr. 81: 1335 (Aug. 24) 1934. Vogt, E.: Ueber die Behandlung gynäkologischer Blutunger mit Vitamin C, ibid. 82: 263 (Feb. 14) 1935. Engelkes, N.: Treatment of Hemorrhagic Disorders with Vitamin C, Lancet 2: 1285 (Dec. 7) 1935.

74. Abt, A. F.: Physiology of Ascorbic Acid in Normal and Abnormal States, J. Physiol. U. S. S. R. 22: 807 (July) 1937.

75. Wright, I. S., and Lilienfeld, Alfred: Pharmacologic and Therapeutic Properties of Crystalline Vitamin C (Cevitamic Acid) with Especial Reference to Its Effects on Capillary Fragility, Arch. Int. Med. 57: 241 (Feb.) 1936. Stephens, D. J., and Hawley, E. E.: Relationship of Vitamin C to the Hemorrhagic Diatheses, J. Lab. & Clin. Med. 22: 173 (Nov.) 1936. Finkle, Philip: Vitamin C Saturation Levels in Body in Normal Subjects and in Various Pathological Conditions, J. Clin. Investigation 16: 387 (July) 1937.

In a recent review on the hemorrhagic states, Witts [76] corroborated the negative therapeutic effect of vitamin C in nonscorbutic hemorrhagic states. This author mentioned the possibility of scurvy being associated with a hemorrhagic disease, the disappearance of some of the symptoms following treatment with the vitamin being due to its effect on the associated scurvy. An interesting report by Neuweiler [77] concerns the vitamin C content of the blood serum of women during normal menstruation. In this study the author found that the vitamin C content of the blood serum did not vary during the menstrual periods of three normal women. Szent-Györgyi and others,[78] in their early work with impure preparations of vitamin C, believed that successful therapeutic effects were attained in some of the nonscorbutic hemorrhagic diseases. He and his co-workers subsequently isolated a flavin which they term "vitamin P" and which they believed was responsible for the effect. In a recent report they have stated that this substance requires for its activity the presence of traces of ascorbic acid and, in the entire absence of ascorbic acid, vitamin P is inactive. According to these results it may be concluded that pure vitamin C has a negative therapeutic action on hemorrhagic diseases of a nonscorbutic etiology. The evidence for the existence of vitamin P is doubtful, however, and it is clear that further work will have to be done in this field before conclusions can be reached.

### RELATION OF VITAMIN C TO OTHER CONDITIONS

*Teeth.*—Because gingivitis and hemorrhage into the gums constitute such a striking symptom of scurvy, the claim that vitamin C has a direct relationship with the well-being of the teeth has been made for a long period. Hanke,[79] in a study on children, concluded that the addition of 1 pint of orange juice and the juice of one lemon to a diet lacking in vitamin C, but otherwise normal, led in many cases to disappearance of gingivitis and an arrest or a reduction of the intensity of dental caries. Keeton [80] has administered 400 mg. of vitamin C daily for four or five days prior to the extraction of a tooth and reported that the effect on healing is striking.

Most of the evidence that vitamin C is related to normal development of the teeth has been deduced largely from experimental work on the guinea pig. The incisor teeth of the guinea pig differ from those of man in that they are constantly growing. One is led to question, therefore, the permissibility of carrying over to man, without reservation, all experimental evidence on this point.

Fish and Harris [81] in their recent work on guinea pigs hold untenable the view of the earlier writers, who noted the formation of "pulp bones" in partial vitamin C deficiency and regarded this occurrence as a type of neoplastic change. By use of a technic in which a series of deficient and normal diets were fed, they noted that vitamin C is necessary for promoting the functional activity of formative cells such as the odontoblasts, ameloblasts and osteoblasts. They noted that in mild chronic vitamin C deficiency the "pulp bone" is the result of a partial degeneration of the odontoblasts, forming a scar tissue.

Wolbach [11] has pointed out that in the growing teeth of guinea pigs a lack of vitamin C causes the formation of dentin to cease and the pulp to become separated from the dentin by a liquid presumably produced by the odontoblasts. In the healing process in guinea pigs the formation of dentin is resumed. Wolbach concluded that, in infants, teeth in the process of formation may possibly be affected by scurvy in a manner similar to that noted in the guinea pig, but that specific evidence of this in the human being is lacking. Hou [82] has reported similar observations in the scorbutic guinea pig. As evidence of a change in mineral content, Toverud [83] has shown that the incisor teeth of scorbutic guinea pigs contain less ash than those of normal animals. Furthermore, the ash is lower in calcium and higher in magnesium that that from teeth of normal controls. The older writers recognize the loosening of teeth in the scurvy of both man and animals, and Boyle, Bessey and Wolbach [84] more recently have pointed out that, besides striking alterations in tooth pulp and dentin, there may be changes in the peridental soft and calcified tissues. They concluded that there may be two types of pyorrhea, a local inflammatory disease and a systemic process causing diffuse atrophy of the alveolar bone. This systemic type of pyorrhea, as it occurs in infantile scurvy, is similar to that found in guinea pigs on a vitamin C-deficient diet. In a limited number of patients with this type of pyorrhea, they have noted a correlation between low blood ascorbic acid values and rarefaction of the alveolar bone. They believe that a low vitamin C intake is an important factor in the production of this type of systemic pyorrhea. The authors made no statement as to the therapeutic effect which vitamin C might have on this type of pyorrhea. It is probable that the beneficial effects noted by Hanke after the addition of large amounts of orange juice were due to amelioration of this systemic type of pyorrhea known to be caused by deficiency of the vitamin. Although there is still a dearth of exact knowledge of vitamin C in its relation to dental and gingival disease in man, there is a general unanimity of opinion that an adequate intake of vitamin C is necessary for normal tooth growth and tooth structure, and the maintenance of healthy gums in man.

*Eye.*—Whether deficiency of vitamin C has any significance in the etiology of cataract has been a matter of dispute. Various workers have found that, as in other tissues of the body, the concentration of vitamin C in the crystalline lens of scorbutic guinea pigs is lower than normal.[85] Low values have been reported in the cataractous lens.[86] Some investigators have been able to produce cataract in some guinea pigs by feeding them

76. Witts, L. J.: The Hemorrhagic States, Brit. M. J. 2:689 (Oct. 9) 1937.

77. Neuweiler, W.: Vitamin C-Spiegel in Blute und Menstruation, Klin. Wchnschr. 16:926 (Sept. 4) 1937.

78. Szent-Györgyi, A.; Armanto, S.; Bentsath, A.; Beret, T., and Rusznyak, S.: Ueber den Einfluss von Substanzen der Flavongruppe auf die Permeabilität der Kapillaren, Vitamin P, Deutsche med. Wchnschr. 62:1325 (Aug. 14) 1936.

79. Hanke, Milton H.: Diet and Dental Health, University of Chicago Press, 1933, p. 143.

80. Keeton, R. W.: Relation of Metabolic Diseases to Dentistry, J. Am. Dent. A. 24:1336 (Aug.) 1937.

81. Fish, E. W., and Harris, L. J.: The Effects of Vitamin C Deficiency on Tooth Structure in Guinea Pigs, Phil. Tr. Roy. Soc. London, 223B, 1933, p. 489.

82. Hou, H. C.: A Comparative Study of the Vitamin C Content of Several Varieties of Chinese Oranges, Chinese J. Physiol. 9:223 (Aug. 15) 1935.

83. Toverud, G.: The Influence of Diet on Teeth and Bone, J. Biol. Chem. 58:358 (Dec.) 1923.

84. Boyle, P. E.; Bessey, O. A., and Wolbach, S. B.: Experimental Alveolar Bone Atrophy Produced by Ascorbic Acid Deficiency and Its Relation to Pyorrhea Alveolaris, Proc. Soc. Exper. Biol. & Med. 36:733 (June) 1937.

85. Von Euler, H., and Malmberg, M.: Ueber die Antiskorbutische Wirkung der Ascorbinsäure und über ihren Gehalt an Nebennieren und Sulfhydrylen, Ztschr. f. physiol. Chem. 230:225 (Oct.) 1934. Johnson.

86. Von Euler, H., and Martius C.: Ueber den Gehalt der Augenlinsen und Sulfhydrylverbindungen und an Ascorbinsäure, Ztschr. f. physiol. Chem. 232:165 (Oct.) 1935.

a scurvy-producing diet,[87] especially if the aqueous humor was drained by paracentesis, but others have not been able to repeat the experiment.[88] Vitamin C is present in the normal lens and vitamin C depletion might conceivably predispose the lens to a greater degree of susceptibility to agents causing cataract which ordinarily do not affect the normal eye. Bellows [89] has studied the level of vitamin C in the blood of cataractous patients and found it to be definitely lower on the average than that of noncataractous persons of similar social status and age group (from 60 to 80 years).

*Skin.*—Vitamin C apparently has a definite relation to pigmentation of the skin. A lessened pigmentation in patients suffering with Addison's disease has been observed [90] after vitamin C had been administered for some time. Schroeder and Einhauser [91] administered 300 mg. of vitamin C intravenously for fourteen days and noticed a decreased pigmentation of the face in a case of pernicious anemia. Cornbleet [92] noted that the excess pigment in the skin in Addison's disease and in scurvy is absorbed when vitamin C is administered. Volpe [93] treated several patients suffering with psoriasis with large doses of ascorbic acid and noted striking improvement. We ourselves have noted depigmentation of the skin following massive vitamin C therapy in Addison's disease. In the case of a Negro, a daily oral dose of 450 mg. over a period of several months produced a noticeable mottling depigmentation below the eyes. It should be noted that large doses, far beyond the normal requirement, have been used to produce these therapeutic results.

The suggestion has been made [49] that vitamin C may be specific in lupus erythematosus as well as in scurvy.

### ENDOCRINE DISTURBANCES

Several observers have pointed out the possibility of a relationship between ascorbic acid and thyroid gland function. Demole and Ippen [94] have demonstrated that loss of weight in guinea pigs on a scorbutic diet could be checked by the administration of 0.5 mg. of ascorbic acid daily. If, however, the animals received 0.1 mg. of thyroxin subcutaneously, the weight loss continued until the amount of daily oral ascorbic acid administration had been raised to from 10 to 20 mg. Demole and Ippen interpreted this as evidence of the antithyrotoxic action of ascorbic acid. Heyl [95] has reported a morphologic change in the thyroid gland induced by ascorbic acid similar in appearance to that obtained by the injection of the thyrotropic hormone of the anterior pituitary lobe. If the extract of the anterior pituitary is subjected to oxidative processes, shown by control experiment to be severe enough to destroy ascorbic acid, the pituitary extract still remained active. The author concluded that, in the case of the thyrotropic action of the anterior pituitary, a substance other than vitamin C is concerned. Spence and Scowen [96] have shown that the daily administration of large doses of ascorbic acid does not prevent the occurrence of thyroid hyperplasia in guinea pigs receiving injections of extract of anterior pituitary containing thyrotropic hormone. Marine and his associates [97] have noted the protective action of ascorbic acid against hypertrophy of the thyroid gland in guinea pigs injected with the thyrotropic factor. Sure and Theis [98] indicate that in experimental hyperthyroidism produced in rats by feeding toxic doses of thyroxin a vitamin C disturbance occurred as evidenced by the reduction of the vitamin C content of the adrenal, the thymus and the kidney, similar to that encountered in scurvy in the guinea pig. According to Paal and Brecht,[99] the administration of thyroxin and thyrotropic hormone to guinea pigs and rats leads to a rise in the ascorbic acid content of the adrenal gland and liver. When cortical extract free from ascorbic acid was given together with these substances, no such rise occurred. These controversial reports indicate the need for further experimental work on the relationship between vitamin C and the thyroid gland.

The relationship of vitamin C to dextrose tolerance in the guinea pig was studied by Sigel and King;[100] successive stages of vitamin C depletion induced a corresponding rise in the fasting blood sugar level and a distinctly lowered dextrose tolerance. Pfleger and Scholl [101] have noted that in diabetic patients saturation with vitamin C intensifies the action of insulin, so that the carbohydrate metabolism of the patient could be regulated with smaller doses of insulin. They also noted that increased vitamin C ingestion lessened fatigue in diabetic patients.

The relationship between vitamin C and Addison's disease has been studied. As shown by Harris and Ray,[102] both the cortex and the medulla of the normal adrenal gland have a high ascorbic acid content. In three cases of Addison's disease studied by Wilkinson and Ashford,[90] using the urinary test of Harris and Ray, there appeared to be a vitamin C subnutrition. Wilkinson's patients were being simultaneously treated with small doses of adrenal cortex extract and vitamin C. On this combined therapy a decrease in pigmentation of the skin was noted in two cases three months after discharge. Hoff [103] has also noted a decrease in pathologic pigmentation in Addison's disease.

In two patients with Addison's disease brought to our laboratory by Dr. Carl Johnson, daily oral administration of 450 mg. of ascorbic acid alone caused considerable depigmentation after from six to ten weeks but failed to improve other addisonian symptoms. This

87. Monjukowa, N. K., and Frandkin, M. J.: Neue experimentelle Befunde über die Pathogenese der Kataraki, Arch. f. Ophth. **133**: 378, 1935.

88. Johnson, S. W.: Cataract and Ascorbic Acid in Guinea Pig Eye, Biochem. J. **30**: 1430 (Aug.) 1936.

89. Bellows, J. G.: Biochemistry of Lens; Cevitamic Acid Content of Blood and Urine of Subjects with Senile Cataract, Arch. Ophth. **15**: 78 (Jan.) 1936.

90. Wilkinson, J. F., and Ashford, C. A.: Vitamin C Deficiency in Addison's Disease, Lancet **2**: 967 (Oct. 24) 1936. Hoff.[103]

91. Schroeder, H., and Einhauser, M.: Ueber einen Zusammenhang zwischen gestorter Vitamin-C-Resorption und pathologischer Pigmentierung bei Gastroenteritis und Achyliagastrica, München. med. Wchnschr. **83**: 923 (June 5) 1936.

92. Cornbleet, Theodore: Vitamin C and Pigment, Arch. Dermat. & Syph. **35**: 471 (March) 1937.

93. Volpe, I.: Ueber mehrer Erfolge in der Psoriasis Behandlung mit Vitamin C, Schweiz. med. Wchnschr. **67**: 498 (May 29) 1937.

94. Demole, V., and Ippen, F.: Die Antithyreotoxische Wirkung von Ascorbinsäure, Ztschr. f. physiol. Chem. **238**: 236, 1935.

95. Heyl, J. G.: Thyreotroper Effekt von Vitamin C (Ascorbinsäure) und Unabhängigkeit der thyreotropen Wirkung des Hypophysen vorderlappens hiervon, Acta brev. Neerland. **4**: 12, 1934.

96. Spence, A. W., and Scowen, E. F.: The Effect of Ascorbic Acid on Experimental Goiter, Biochem. J. **29**: 562 (Jan. 15) 1935.

97. Marine, David; Baumann, E. J., and Rosen, S. H.: Effect of Ascorbic Acid on Thyroid and Suprarenals of Guinea Pigs, Proc. Soc. Exper. Biol. & Med. **31**: 870 (April) 1934.

98. Sure, Barnett, and Theis, R. M.: Hyperthyroidism and Vitamin C, Proc. Soc. Exper. Biol. & Med. **37**: 646 (Jan.) 1938.

99. Paal, H., and Brecht, K.: Ascorbinsäure und Schilddrusenfunktion, Klin. Wchnschr. **16**: 261 (Feb. 20) 1937.

100. Sigel, A., and King, C. G.: Relationship of Vitamin C to Glucose Tolerance in Guinea Pig, J. Biol. Chem. **116**: 489 (Dec.) 1936.

101. Pfleger, R., and Scholl, F.: Diabetes and Vitamin C, Wien. Arch. f. inn. Med. **31**: 169 (Oct. 31) 1937.

102. Harris, L. J., and Ray, S. N.: Vitamin C in the Suprarenal Medulla, Biochem. J. **27**: 2004 (No. 6) 1933.

103. Hoff, F.: Beiträge zum Problem der krankhaften Hauptpigmentierungen, Deutsche med. Wchnschr. **62**: 129 (Jan. 24) 1936.

is in agreement with the observation of Siwe,[104] who also noted a decreased pigmentation without relief from the characteristic symptoms of Addison's disease.

### GASTROINTESTINAL DISEASES

We have already referred to the subject of absorption, destruction and elimination of vitamin C in the gastrointestinal tract. Alt, Chinn and Farmer [105] found low blood values for vitamin C in patients suffering with achlorhydria. Einhauser [106] has reported an altered absorption of vitamin C in patients suffering with catarrhal gastro-enteritis. Although Stepp [107] points out that gastrointestinal disturbances can be the cause as well as the result of lack of vitamins, it is debatable whether a lack of vitamin C can be looked on as a direct contributing factor to gastric ulcer. In Schultzer's [108] studies the improbability of C-avitaminosis as an etiologic factor in peptic ulcer is pointed out. Harris, Abbasy, Yudkin and Kelly [109] and Archer and Graham [110] reported low urinary excretion values for patients suffering with gastric ulcer. However, these low excretion values may have been related to the low dietary content of the diets prescribed for ulcer. Several investigators [111] have recently pointed out that the usual diets given patients suffering with peptic ulcer are likely to be deficient in vitamin C. The exact relationship of this dietary deficiency to hemorrhage from the ulcers is as yet unproved, although it would certainly seem advisable to supplement peptic ulcer diets with vitamin C. Portnoy and Wilkinson,[112] using urinary excretion, blood plasma level and intradermal tests, have shown a marked vitamin C deficiency in patients suffering from peptic ulcer. The severest degree of deficiency was found in patients with hematemesis. We ourselves have noted a mild scurvy develop in several patients on strict ulcer diets, because of a lack of vitamin C in the dietary.

Gaehtgens [113] has reported on hypovitaminoses of intestinal origin in pregnancy. He points out that there is an increased vitamin C requirement in pregnancy as the fetus gains its supply of ascorbic acid directly from the food intake of the mother. Gaehtgens reports the case of a pregnant woman who, because of a severe ulcerative colitis and a restricted diet, acquired a severe deficiency of vitamin C, and he points out that, whenever gastrointestinal disturbances develop during pregnancy, it may be necessary to supply the maternal organisms with adequate amounts of vitamin C administered parenterally.

### RELATION OF VITAMIN C TO IMMUNITY

A considerable amount of experimental work has been published with regard to the relationship of vitamin C to immunity, and this material has recently been comprehensively reviewed.[114] It is not within the scope of this article to take up in detail all the reports covering this subject. Among the first observers to note an altered immunologic response when ascorbic acid was administered in sufficient doses were Sulzberger and Oser.[115] These authors in a controlled experiment noted that large doses of ascorbic acid reduced and inhibited the susceptibility of the skin of the guinea pig to experimental sensitization with neoarsphenamine. Cormia [116] noted that a high vitamin C diet should be of value to all patients receiving arsphenamine and that intensive therapy with vitamin C may be helpful in treating patients with post-arsphenamine dermatitis. Landfisch [117] similarly reported that he was able to treat twenty-five patients who had previously shown definite sensitization to neoarsphenamine and marked symptoms of intolerance when the arsenical was administered alone by combining ascorbic acid injections with neoarsphenamine or by administering the ascorbic acid one-half hour before the neoarsphenamine. Further evidence of the increased tolerance of the organism for arsphenamine after ascorbic acid therapy has been reported recently by Dainow.[118] Vitamin C is apparently of value in controlling the intolerance to arsenicals which must be intravenously administered.

Meyer [119] believes that the toxic symptoms produced by chronic benzene poisoning may be due to an avitaminosis C. Experiments with guinea pigs showed that the toxic effect of an injection of 0.25 cc. of benzene four times a week was counteracted when a daily dose of 20 mg. of ascorbic acid was added to a scorbutic basal diet. As a possible mechanism for this effect, Vauthey [120] has recently suggested that ascorbic acid exerts a stimulatory effect on the liver, resulting in reduced toxicity of the chemical medicament.

Epstein [121] noted that large doses of vitamin C aided in the desensitization of patients suffering with bronchial asthma. Jusatz,[122] using rabbits on a deficiency diet, was able to augment the specific precipitant titer from ten to a hundred fold by adding ascorbic acid to each dose of horse protein intravenously injected. The oral administration of vitamin C failed to increase the specific precipitant titer. Madison and Manwaring [123] have confirmed Jusatz's experiments in rabbits using horse serum plus 100 mg. of crystalline vitamin C. These authors also noted

104. Siwe, S.: Das Verhalten der C-Vitamin bei Morbus Addisoni, Klin. Wchnschr. **14**: 1311 (Sept. 14) 1935.

105. Alt, H. L., Chinn, Herman, and Farmer, C. J.: The Blood Cevitamic Acid in Patients with Achlorhydria, read before the Central Society for Clinical Research, Chicago, Nov. 5, 1937.

106. Einhauser, M.: C-Vitamin und Gastroenteritis, Ztschr. f. d. ges. exper. Med. **98**: 461, 1936.

107. Stepp, W.: Neure Gesichtspunkte in der klinischen Anwendung der rein dargestellten Vitamine, Angewandte Chemie **50**: 30 (Jan. 2) 1937.

108. Schultzer, P.: Studies on Capillary Resistance: Improbability of C-Vitaminosis as Etiologic Factor in Peptic Ulcer, Acta med. Scandinav. **83**: 555, 1934.

109. Harris, L. J.; Abbasy, M. A.; Yudkin, John, and Kelly, Simon: Vitamins in Human Nutrition: Vitamin C Reserves of Subjects of Voluntary Hospital Class, Lancet **1**: 1488 (June 27) 1936.

110. Archer, H. E., and Graham, George: The Subscurvy State in Relation to Gastric and Duodenal Ulcer, Lancet **2**: 364 (Aug. 15) 1936.

111. Rivers, A. B., and Carlson, L. A.: Vitamin C as Supplement in Therapy of Peptic Ulcer: Preliminary Report, Proc. Staff Meet., Mayo Clin. **12**: 383 (June 16) 1937. Easterman, G. B.: Peptic Ulcer; Medical Management, Minnesota Med. **20**: 766 (Dec.) 1937. Ingalls, T. H., and Warren, H. A.: A Symptomatic Scurvy, New England J. Med. **217**: 443 (Sept. 9) 1937.

112. Portnoy, Benjamin, and Wilkinson, J. F.: Intradermal Test for Vitamin C Deficiency, Brit. M. J. **1**: 328 (Feb. 12) 1938.

113. Gaehtgens, G.: Die Beziehungen intestinal bedingter Hypovitaminosen zur Schwangerschaft, Klin. Wchnschr. **16**: 444 (March 27) 1937.

114. Robinson, E. C.: The Vitamins and Resistance to Infection, Medicine **15**: 121 (May) 1936. Perla, David, and Marmorston, Jessie: Role of Vitamin C in Resistance, Arch. Path. **23**: 543 (April) 1937; Role of Vitamin C in Resistance, ibid. **23**: 683 (May) 1937.

115. Sulzberger, M. B., and Oser, B. L.: Influence of Ascorbic Acid of Diet on Sensitization of Guinea Pigs to Arsphenamine, Proc. Soc. Exper. Biol. & Med. **33**: 716 (Feb.) 1935.

116. Cormia, F. E.: Experimental Arsphenamine Dermatitis; Influence of Vitamin C in Production of Arsphenamine Sensitiveness, Canad. M. A. J. **36**: 392 (April) 1937.

117. Landfisch, S.: Synthetic Ascorbic Acid New Auxiliary Remedy in Arsphenamine Therapy, Polska gaz. lek. **16**: 575 (July 18) 1937.

118. Dainow, I.: Intolérance aux arsénobenzenes et vitamin C, Presse méd. **45**: 1670 (Nov. 24) 1937.

119. Meyer, A.: Chronische Benzolvergiftung und Vitamin C, Ztschr. f. Vitaminforsch. **6**: 83 (Jan.) 1937.

120. Vauthey, M.: Vitamin C (l-Ascorbic Acid) and Tolerance for Chemical Medicaments, Chem. Abstr. **32**: 995 (Feb. 10) 1938.

121. Epstein, Alexander: Vitamin C in Desensitization; Advances in Vitamin Treatment, Schweiz. med. Wchnschr. **66**: 1057 (Nov. 7) 1936.

122. Jusatz, H. J.: Der Einfluss der Vitamine auf den Immunisierungszustand des tierischen Organismus; wasserlösliche Vitamine, Ztschr. f. Immunitätsforsch. u. exper. Therap. **88**: 483 (Aug. 4) 1936.

123. Madison, R. R., and Manwaring, M. E.: Ascorbic Acid Stimulation of Specific Antibody Production, Proc. Soc. Exper. Biol. & Med. **37**: 402 (Nov.) 1937.

that, when the horse serum and ascorbic acid were injected separately, either at different times into the same vein or into different veins, the antibody stimulation was less pronounced than the effect obtained by mixing the horse serum and vitamin C before injection. Lemke [124] has reported that vitamin C, when injected intravenously into hypersensitive guinea pigs, desensitizes them. However, van Niekerk [125] states that vitamin C has no protective action for guinea pigs against anaphylactic shock to horse serum. He noted that no protective action resulted when the second dose of horse serum was combined with from 25 to 100 mg. of ascorbic acid. Hochwald [126] states that, if 100 mg. of vitamin C is injected into sensitized guinea pigs a few minutes before the shocking dose, no anaphylaxis develops. Solomonica [127] observed that, if his guinea pigs were injected with vitamin C prior to or during the sensitizing period, many of them survived. The protective effects of ascorbic acid were much lessened if the vitamin was given later, e. g. shortly before the shocking dose.

Vitamin C has recently been related to the complement content of the blood.[128] Ecker [129] and his co-workers have shown a definite correlation between the complement titer of guinea pig serum and the vitamin C content of the blood serum. When the animals were placed on a scorbutic diet the complement titer dropped, paralleling the decrease in ascorbic acid blood values. The values rose when vitamin C was fed to the scorbutic animals.

Jungeblut [130] noted that vitamin C, when added to tetanus toxin in vitro, inactivates the toxin though it fails to confer complete protection against tetanus intoxication in vivo. This author furthermore states that, as far as its in vitro action is concerned, vitamin C cannot be regarded as a specific detoxicant for any given virus or toxin.

It therefore seems probable that vitamin C, particularly when administered intravenously, is capable of protecting the body against certain drug intolerances, as noted for the arsenicals, of stimulating experimental antibody production, and perhaps of protecting against experimental anaphylaxis. The failure of oral administration is interesting and requires further experimental work for its explanation. The whole field of the relationship of vitamin C to natural resistance and immunity is but in its infancy, and much more experimental and clinical evidence must be accumulated before any definite therapeutic claims seem justifiable.

### INFECTIONS AND INFECTIOUS DISEASES

Recent reviews suggest that a low vitamin C intake may be one of the causes of lowering natural resistance. There is evidence also that in the course of certain infections there is a greater demand for vitamin C.[131] There have been numerous suggestive reports of the possible role of vitamin C in infectious diseases but the evidence is not yet clearcut. The effect of vitamin C on the integrity of the tissues is probably concerned with its role in the production of normal intercellular cement substances. This in turn may be prerequisite to the maintenance of natural resistance of the organism to infection.

Evidence showing the desirability of trying the effect of administering vitamin C, along with other treatment of infections, has been obtained chiefly by studying the vitamin C content of the blood plasma and the amount of vitamin C excreted in the urine. Low values for either or both have been observed in mild coryzal fever, acute pharyngitis, persistent chronic nasal sinusitis, chronic otitis media, acute respiratory infection, active osteomyelitis, rheumatoid arthritis, and rheumatic fever in children.

The administration of vitamin C has been tested in a number of disease conditions, and favorable reports have appeared in pneumonia, pertussis and rheumatic fever. Negative results have been reported in poliomyelitis, and the results are inconclusive in diphtheria.

It is evident that vitamin C is not a specific therapeutic agent in the treatment of any of these diseases. It should not be forgotten, however, that the importance of an ample diet has long been recommended in the treatment of febrile conditions, and such patients have perhaps an increased requirement for all of the vitamins.

### WOUND HEALING AND SURGICAL CONDITIONS

Hans Aron [64] noted that in scorbutic children wounds of the skin often remained open without a tendency to heal. Following therapy with vitamin C, he observed that these wounds healed quickly. In a 6 weeks old infant whose laparotomy wound opened postoperatively, Lanman and Ingalls [132] noted a definite early scurvy at autopsy. The authors then performed laparotomy on guinea pigs which had been on previous scorbutic diets. At intervals after operation the animals were killed and the authors report that the wounds broke down more easily in the scorbutic pigs than in the nonscorbutic controls. On histologic examination they noted defective repair of the corium and a poor production of collagen in the scars of the scorbutic animals. This is in agreement with the role which vitamin C plays in the formation of collagen. Taffel and Harvey [133] have recently confirmed the work of Lanman and Ingalls and expressed the opinion that vitamin C deficiency in man may indeed be one of the major causative factors in these cases of wound disruption where there is no evidence of infection of the wound. From the evidence presented one may conclude that vitamin C has an important role in the healing of surgical wounds. When a history of low vitamin C intake or a low plasma value is obtained preoperatively, it would seem logical to administer vitamin C preoperatively and postoperatively. Hanke [134] noted apparent acceleration of bone healing in fractures, following administration of vitamin C. Lauber, Bersin

124. Lemke, H.: Beeinflussung des anaphylaktischen Shocks der Meerschweinchen durch C-Vitamin, Monatschr. f. Kinderh. 67: 244 (Nov.) 1936.
125. van Niekerk, J.: Anaphylaxis and Vitamin C, J. Allergy 8: 446 (July) 1937.
126. Hochwald, A.: Allergiefragen und vitamin C, Zentralbl. f. inn. Med. 58: 769 (Sept. 21) 1937.
127. Solomonica, Bruno: Vitamin C and Anaphylactic Shock in Guinea Pigs, J. Immunol. 31: 209 (Sept.) 1936.
128. Vitamin C and Complement, editorial, J. A. M. A. 110: 2157 (June 25) 1938.
129. Ecker, E. E.; Pillemer, L.; Wertheimer, D., and Gradia, H.: Ascorbic Acid and Complement Function, J. Immunol. 34: 19 (Jan.) 1938.
130. Jungeblut, C. W.: Inactivation of Tetanus Toxin by Crystalline Vitamin C (l-Ascorbic Acid), J. Immunol. 33: 203 (Sept.) 1937.
131. The clinical reports have been most numerous. The reader is referred to the extensive bibliographies to be found in the review by Robinson [55] and the reviews by Perla and Marmorston.[54]
132. Lanman, T. H., and Ingalls, T. H.: Vitamin C Deficiency and Wound Healing: Experimental and Clinical Study, Ann. Surg. 105: 616 (April) 1937.
133. Taffel, M., and Harvey, S. C.: Effect of Absolute and Partial Vitamin C Deficiency on Healing of Wounds, Proc. Soc. Exper. Biol. & Med. 38: 418 (May) 1938.
134. Hanke, H.: Experimentelle Untersuchungen über Beeinflussung der Knochenregeneration durch Vitamin C, Deutsche Ztschr. f. Chir. 248: 530, 1937.

and Nafziger[135] report an increased demand for vitamin C in infection of a surgical nature. Myerson[136] suggests that vitamin C deficiency is one of the possible factors in hemorrhage following tonsillectomy.

### CONCLUSIONS

Vitamin C is definitely indicated as a therapeutic agent in the prevention and cure of scurvy. Whether vitamin C has a definite causal relationship to any other pathologic process is as yet uncertain. The vast amount of investigative and clinical research reported to date seems to be indicative of a further therapeutic role for vitamin C, though not enough progress has been attained to allow definite therapeutic conclusions to be formulated. Certain suggestive conditions may be briefly outlined when, aside from the prevention and cure of scurvy, vitamin C may be therapeutically indicated.

An ample supply is indicated in the diet of the pregnant woman and nursing mother. If the possibility of a prescorbutic state is accepted or if the existence of latent scurvy is recognized, it is imperative that adequate diagnostic methods and criteria be formulated in order to prevent the development of such states, which would be conditions of suboptimal nutrition and possibly deleterious to general health. We believe that fasting blood plasma values are to date the best method for determining the possibility of such a state. In order to prevent the occurrence of such a possibility, the minimal human requirement for vitamin C must be definitely known. Whether this requirement varies for different ages and different individuals is unknown.

The question of absorption following oral ingestion is of the utmost importance. Absorption has been entirely overlooked by most investigators and, when mentioned in the literature, has been discussed chiefly as a theoretical possibility. Little or nothing is known concerning the assimilation of vitamin C and its metabolism in abnormal and normal states. The implication that there is an increased need and an augmented metabolism for vitamin C in many infections is generally noted in all the numerous reports available. The exact proof for this important fact is lacking. How fever, toxemia and specific bacteria act on vitamin C in individual infections is still unknown. How vitamin C is absorbed, assimilated and utilized in specific infections is still unknown. The relation of vitamin C to the endocrines has been noted, and there are implications that it may be specifically related to hyperthyroidism, diabetes and Addison's disease. The exact facts are still lacking; this is more or less true of the other specific conditions here reviewed.

The failure of the oral administration of vitamin C in certain conditions in which its parenteral administration gives positive experimental or clinical results, and the positive results following its use in extremely large doses when its use in small doses was unavailing, are paradoxical questions which need elucidation.

Perhaps the value of a view on the therapeutic indications and implications for vitamin C at this time lies in its urge to spur us on to fill the gaps in our present knowledge which, it will be hoped, are as evident to the reader as they have been to the reviewers.

135. Lauber, H. J.; Bersin, T., and Nafziger, H.: Der Ascorbinsäurebedarf bei chirurgischen Infektionen, Klin. Wchnschr. 16:1274 (Sept.) 1937.
136. Myerson, M. C.: Hemorrhage Following Tonsillectomy, Am. J. Surg. 39:151 (April) 1937.

## Council on Foods

### ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED.

FRANKLIN C. BING, Secretary.

### MRS. PALEY'S BABY FOOD—STRAINED CALF LIVER SOUP WITH VEGETABLES AND CEREAL

*Manufacturer.*—Paley-Sachs Food Company, Houston, Texas.

*Description.*—Strained liver soup containing calf liver, carrots, potatoes, green peas, tomato purée, cabbage, celery, okra, onions, barley, brown rice and spinach, slightly seasoned with salt.

*Manufacture.*—The vegetables and cereal are prepared as described for Mrs. Paley's Baby Food—Strained Vegetable Soup with Beef Broth and Cereal (THE JOURNAL, Sept. 17, 1938, p. 1101). The liver is washed, skinned, and sieved raw. The strained liver, vegetables and cereals are thoroughly mixed, filled into jars, vacuum sealed and heat processed.

*Analysis* (submitted by manufacturer).—Moisture 83.1%, total solids 16.9%, ash 0.9%, fat (ether extract) 0.6%, protein (N × 6.25) 4.6%, reducing sugars as dextrose 1.8%, sucrose (not determined), crude fiber 0.6%, total carbohydrates other than crude fiber (by difference) 10.2%, calcium (Ca) 0.004%, phosphorus (P) 0.021%, iron (Fe) 0.0009%.

*Calories.*—0.6 per gram; 17 per ounce.

### NUTRADIET UNDILUTED TOMATO JUICE

*Distributor.*—The Nutradiet Company, a subsidiary of S & W Fine Foods, Inc., San Francisco.

*Description.*—Canned tomato juice without added salt retaining in high degree the original vitamin content.

*Manufacture.*—Vine-ripened, selected tomatoes on which no toxic spray has been used are washed, lightly scalded and pressed against a mesh screen to extract the juice, which is heated to 82 C. The cans are filled, sealed and processed at 85 C. for three minutes. All the equipment that comes in contact with the juice is made of stainless steel.

*Analysis* (submitted by manufacturer).—Moisture 93.3%, total solids 6.7%, ash 0.5%, fat (ether extract) 0.07%, protein (N × 6.25) 1.1%, crude fiber 0.2%, carbohydrates other than crude fiber (by difference) 4.3%, titratable acidity (as malic and citric acids) 0.57%, vitamin C (titration) 12.8 mg. per 100 cc.

*Calories.*—0.22 per gram; 6 per ounce.

*Vitamins.*—76 international units per fluid ounce.

*Claims of Manufacturer.*—For use in special diets in which sugar or salt is proscribed or in quantitative diets of calculated composition.

### SUNFILLED BRAND CONCENTRATED GRAPEFRUIT JUICE

*Manufacturer.*—Citrus Concentrates, Inc., Dunedin, Fla.

*Description.*—Canned concentrated grapefruit juice prepared from Florida grapefruit.

*Manufacture.*—The method is the same as that described for Sunfilled Brand Concentrated Orange Juice (THE JOURNAL, Aug. 20, 1938, p. 713).

*Analysis* (submitted by manufacturer).—Moisture 18.0%, total solids 82.0%, ash 2.8%, protein (N × 6.25) 4.5%, reducing sugar as invert 41.7%, sucrose 18.3%, carbohydrates (by difference) 65.5%, citric acid 9.2%, vitamin C (iodine titration) 3.7 mg. per gram, specific gravity 1.40.

*Calories.*—2.80 per gram; 80 per ounce.

*Vitamins.*—The concentrate, when diluted with 9 parts of water by volume, furnishes approximately 996 international units of vitamin C per hundred grams of solution; when diluted with 11 parts of water by volume, the solution contains 830 units per hundred grams.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street . . . Chicago, Ill.

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Seven dollars per annum in advance

*Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.*

SATURDAY, OCTOBER 22, 1938

## THE AMERICAN PHARMACEUTIC INDUSTRY PROMOTES INTENSIVE RESEARCH

Within the past few years, leading corporations in the pharmaceutic industry have developed great laboratories to be devoted mainly to research. Several years ago Eli Lilly & Co. and Merck & Co. dedicated, with impressive ceremonies, well equipped laboratories for promotion of original investigations. Early in October the Abbott Laboratories and E. R. Squibb & Sons dedicated two large buildings. In the dedication of these laboratories many leaders in the field of scientific research, in medical education and in medical organization in the United States cooperated. Thus the speakers at the dedication of the Abbott Laboratories included the president of the Massachusetts Institute of Technology, the Surgeon General of the United States Public Health Service, leading investigators in research concerning the glands and the vitamins, and many others of note. In the dedication of the new Squibb laboratories, Nobel prize winners participated, as well as other distinguished educators and investigators. Apparently the American pharmaceutic industry is no longer the degenerate and spoiled child of medicine but has now become a real contributor to medical advancement. Certainly the contrast with the medicine of an earlier day is striking.

But a few decades ago the suggestion that a pharmaceutic house might spend vast sums of money on medical research, some of it of the type called "pure" research, would have been laughed to scorn. The pharmaceutic industry at the turn of the century was devoted largely to the manufacture of products included in the United States Pharmacopeia and to the promotion of "shot-gun" concoctions of chemicals and herbs sold with weird and extraordinary claims. The Food and Drugs Act of 1906, the establishment of the Council on Pharmacy and Chemistry of the American Medical Association and the regular reports of the Association's Bureau of Investigation had a significant effect in the purification of this industry. Yet at the same time the advance on the part of progressive houses may well be credited not so much to these purifying factors as to scientific advancement in the field of therapeutics. Perhaps the most epoch making of all the discoveries that have been made were arsphenamine and insulin. Certainly Ehrlich's contribution was a stimulus to chemotherapy beyond any other of which we have knowledge, unless we include the new impetus given to this field by the development of sulfanilamide. Again the contribution of Banting and his co-workers of insulin stimulated research related to the active principles of the endocrine system. No doubt the possibilities associated with barbituric acid derivatives and the isolation of vitamins in pure form served also to a considerable extent to indicate to this great industry the possibilities for those who had something new to contribute.

Perhaps it would be folly to suggest that the great laboratories of research now associated with practically all the great pharmaceutic houses of this country have been built wholly out of philanthropic motives or out of that innate curiosity which animates the medical investigator. In these times competition is keen. Whenever a new product is discovered in any field, every pharmaceutic corporation endeavors to develop a product exclusively its own and preferably one for which claims may be made beyond those acceptable for the products manufactured by others. Thus the research laboratory may be expected from time to time to announce notable improvements over new products as rapidly as they come into use. Certainly everywhere at this time investigators are experimenting with sulfanilamide with the hope of developing new products of similar character with perhaps better action against certain bacterial organisms, perhaps lessened toxicity, perhaps greater efficiency. Out of such research may come some product of the utmost benefit to the medical profession and to the public.

The building of these great laboratories by the pharmaceutic industry indicates furthermore a confidence in the permanence of a free and independent medical profession. Certainly a medical profession subject to governmental interference or state control would result for pharmacy, as well as for medicine, in the hamstringing of progress. No doubt these great industries have tested the public pulse and have embarked on these new ventures with the feeling that the fundamental principles necessary to sound medical practice are vital to the life of man and that, even though they may be temporarily set aside, their truth will give them permanence. On a firm foundation like the scientific medicine of today, industry may well build to higher and higher things.

Since the fountain head of pure research has been in the universities, it is no more than right that the great commercial concerns should repay their debt by assuming their share of the burden.

## DEATHS FOLLOWING ELIXIR OF SULFANILAMIDE-MASSENGILL: VIII

About a year has passed since THE JOURNAL first announced the deaths which followed the administration of Elixir of Sulfanilamide prepared and sold by the S. E. Massengill Company of Bristol, Tenn. Preliminary tests at that time showed the poisonous fluid to consist essentially of 40 grains of sulfanilamide to the fluidounce of a menstruum containing approximately 72 per cent of diethylene glycol by volume, with flavoring. Week by week the number of deaths increased eventually to more than seventy-five. Within two weeks after the first editorial was published, the A. M. A. Chemical Laboratory had confirmed the preliminary tests and reports were published under its auspices, showing that the toxic ingredient was diethylene glycol. Maps were also published indicating the area in which the detail men of the Massengill Company had promoted the elixir to members of the medical profession. Recently an extensive report in THE JOURNAL by Geiling and Cannon[1] detailed the results of extensive studies of pharmacologic and pathologic effects following the ingestion of diethylene glycol or the Elixir of Sulfanilamide-Massengill.[2] During the first few weeks of the tragedy the United States Food and Drug Administration traced all shipments and removed them from the market. Federal inspectors also traced deaths reported in local communities. There was close cooperation between the government agencies and the headquarters of the American Medical Association. The publicity issued by THE JOURNAL warned the public; otherwise the number of deaths might have been higher. Had the medical profession followed the Council on Pharmacy and Chemistry, these tragedies would not have occurred: first, because the Council had consistently refused to accept, and to this day has not accepted, any liquid preparation of sulfanilamide, as there has been no evidence of usefulness and stability; second, because no product of the S. E. Massengill Company ever stood accepted for inclusion in New and Nonofficial Remedies. Had all physicians "followed the Council" or had the manufacturer followed the reasonable procedure[3] of investigating the product before putting it on the market, nearly a hundred lives might have been saved. It will be recalled that the Secretary of Agriculture stated that the elixir had been prepared without any testing whatever other than that for flavor; that the total shipments amounted to 633. The number of deaths reported by government investigators as due to the "elixir" totaled close to a hundred.

The only basis of action under the Food and Drug Act, as pointed out by Secretary Wallace, was the allegation that the word "elixir" implied an alcoholic solution, whereas the product was a diethylene glycol solution—notwithstanding the fact that there was evidence of danger from internal administration of diethylene glycol, prior to the marketing of Elixir of Sulfanilamide-Massengill.

To all such tragedies there is an aftermath. The unwarranted carelessness on the part of a pharmaceutic house awakened Congress and officials of the government to the necessity of taking action to protect the public. Congress passed a bill providing that no new drug or any modifications of old drugs may be placed on the market until the entire formula has been submitted to the Food and Drug Administration of the United States Department of Agriculture and the firm licensed to market the drug. Congress further enacted the long overdue Food and Drug Act, with somewhat awkward enforcement provisions. The Food and Drug Administration retains supervision over the product itself and over the labels and circulars accompanying the trade package. Claims made by other means, such as the radio, the spoken word, circular or newspaper advertisng or even advertisements in medical periodicals (under certain definitions), are under the supervision of the Federal Trade Commission.

The Department of Justice, with the Food and Drug Administration, instituted legal proceedings against Samuel Evans Massengill, owner of the Massengill Company. A federal court at Greenville, Tenn., upheld the contention of the government that there was adulteration and misbranding. One hundred and sixty-six counts were filed against the concern, fifty-six charging that the drug was adulterated when it was shipped in that its purity fell below the professed standard under which it was sold and fifty-six charging that the drug was misbranded in that the name "Elixir of Sulfanilamide" was false and misleading. The remaining fifty-four counts charged that the drug was misbranded in that the statement "Quality Pharmaceuticals" appearing on the stickers attached to the corks of the bottles was false and misleading. The defendant, by his counsel, filed a demurrer to the charges. Following oral arguments and filing of briefs, the court ruled with the defendant with respect to the fifty-four misbranded counts involving the statement of "Quality Pharmaceuticals" but decided that the 112 counts alleging adulteration and misbranding in connection with the statement "Elixir of Sulfanilamide" did set up violations of the Food and Drug Act. October 3 the defendant's counsel pleaded guilty to the 112 counts of information and thereupon was sentenced to pay a fine of $150 on each count, making a total of $16,800. In addition there are still pending against Samuel Evans Massengill sixty-two counts to be brought before the district court of Kansas City, covering shipments of Elixir of Sulfanilamide made from the Kansas City plant of the company. Even if it might be assumed that the latter court will impose a similar fine for these counts, the

1. Geiling, E. M. K., and Cannon, P. R.: Pathologic Effects of Elixir of Sulfanilamide (Diethylene Glycol) Poisoning, J. A. M. A. 111:926 (Sept. 3) 1938.

2. For details concerning the symptoms, examination of products and the many reports, see THE JOURNAL A. M. A. 108:1340, 1345 (April 17), 1888 (May 29) 1937; 109:358 (July 31), 1128 (Oct. 2), 1367 (Oct. 23), 1454, 1456 (Oct. 30), 1531, 1544 (Nov. 6), 1724, 1727 (Nov. 20), 1992 (Dec. 11) 1937; 110:1610 (May 7) 1938; 111:938 (Sept. 3) 1938.

3. See summary in article by Geiling and Cannon.[1]

total would be $26,100. The Food and Drug Administration merits commendation for its vigorous pursuit of the Massengill episode.

In the attempt to secure justice for the public in this case, federal officials were miserably handicapped by the weak law in existence at the time of the offense. A similar incident would not be dealt with so lightly under the new laws. Of course if the word "elixir" had not been used it is unlikely that any member of the medical profession would have prescribed the product, since "elixirs" are widely used and the solvents are not presumed to contain active or poisonous ingredients. Sulfanilamide itself has been recognized as an extremely valuable drug in restricted conditions. Physicians who used the elixir failed to realize that it is far safer to limit prescriptions of nonofficial articles to those brands accepted by the Council on Pharmacy and Chemistry and to use them as described in New and Nonofficial Remedies. It is always hazardous to prescribe unstandardized and uncontrolled remedies, or drugs sold under catchy names. Any pharmaceutic house which desires to market its products honestly and in accordance with the rules of the Council may have its products considered.

## STAPHYLOCOCCIC FOOD POISONING

The continued frequency of outbreaks of poisoning due to staphylococcic contaminations of food serves to emphasize the importance of this condition as a public health problem. Special mention should be made of the outbreaks of food poisoning involving more than 250 men in the marine base at Quantico, Va., and of the 124 men on the U. S. S. *Arizona*,[1] of the 110 persons of twenty-eight families in San Francisco,[2] of the small outbreak that resulted from eating liver sausage in the Netherlands[3] and of those reported in Hamilton, Ont.,[4] and Billings, Mont.[5] The Quantico and *Arizona* outbreaks were both attributed to contamination of ham with staphylococci, and that in San Francisco was attributed to custard cakes. In the Hamilton outbreak a number of strains of Staphylococcus aureus were isolated from cream and custard food products, from utensils and raw materials used in preparation of the food, and from the noses and throats of the employees in the bakery at which the food was prepared. The strains isolated could be divided into two distinct groups on the basis of their toxigenic and other properties. The data obtained leave little doubt as to the etiologic agent and the source of infection of the food; since the micro-organisms were so widely disseminated throughout the bakery it seems probable that one person had spread the infection to his fellow employees and thence it was conveyed to the raw materials, utensils and finished food products. Similarly, the outbreak in Billings was attributed on investigation to filling for an orange cream cake, smears from which revealed staphylococci in large numbers. In this outbreak, however, investigations did not reveal the source of the contamination.

The symptoms of staphylococcic food poisoning are characteristic. The onset usually occurs rapidly following the ingestion of the infected material and is manifested by nausea, vomiting, abdominal pain, diarrhea and prostration without elevation of body temperature. While the symptoms vary in their acuteness, apparently depending on the toxigenic properties of the staphylococci involved, the train of events is characteristic and recovery is reasonably rapid and benign.

The symptoms described can usually be identified as food poisoning; the source can often be determined, but it has proved more difficult to ascertain the exact nature of the offending agent, since other organisms frequently cause similar symptoms. Furthermore, the determination of enterotoxicity has been fraught with great technical difficulties. Recently Dolman and his co-workers[6] apparently devised a test for staphylococcus enterotoxin on kittens which appears to be both practical and specific. The enterotoxin has definite and specific antigenic properties and the serums of animals immunized with filtrates containing enterotoxin developed neutralizing properties against this antigen. A specific flocculation reaction can then be distinguished. This method has already received independent and confirmatory study.[7] Other technics for determining the toxic properties also are receiving investigation. Thus Chapman and his co-workers,[8] in studying the food poisoning staphylococci, conclude that change in the cultural characteristics of these strains indicates degeneration, and hemolysis more than any other one quality appears to be the best indicator of degeneration. These investigators also studied the Stone reaction in a large number of strains. Stone[9] in 1935 stated that strains of food poisoning could be differentiated from other staphylococci by their action on Stone's gelatin agar. Chapman and his colleagues found the Stone reaction positive in 70.5 per cent of typical food poisoning staphylococci and positive also in 27.6 per cent of strains with similar properties but isolated from non-food poisoning sources. They suggest, therefore, that the Stone reaction should be applied only to variants that react positively to the previously mentioned

1. Wade, F. M.: Observations on Staphylococcus Food Poisoning, U. S. Nav. M. Bull. 36: 306 (April) 1938.
2. Geiger, J. C.: Report of Two Outbreaks of Food Poisoning, Pub. Health Rep. 52: 765 (June 11) 1937.
3. Timmerman, W. A.: Voedselvergiftiging door Staphylococcus, Nederl. tijdschr. v. geneesk. 2: 4443 (Sept. 18) 1937.
4. Wilson, R. J.: Laboratory Report of Strains of Staphylococci Isolated During the Outbreak, Canad. Pub. Health J. 29: 329 (July) 1938.
5. Cogswell, W. F.; Kilbourne, B. K., and Kuhns, Edith: Staphylococcal Food Poisoning in Billings, Mont., Canad. Pub. Health J. 29: 333 (July) 1938.
6. Dolman, C. E., and Wilson, R. J.: Experiments with Staphylococcal Enterotoxin, J. Immunology 35: 13 (July) 1938.
7. Kupchik, G. J.: Some Cultural and Biochemical Characteristics of Enterotoxic Staphylococci, J. Infect. Dis. 61: 120 (Nov.-Dec.) 1937. Davison, Ellen; Duck, G. M., and Cory, W. E.: Attempts to Assay the Enterotoxic Substance Produced by Staphylococci by Parenteral Injection of Monkeys and Kittens, Bull. 60: 219 (March-April) 1938.
8. Chapman, G. H.; Lieb, C. W., and Curcio, Lillian G.: Isolation and Cultural Differentiation of Food-Poisoning Staphylococci, Food Research 3: 349 (No. 4) 1937.
9. Stone, R. V.: A Cultural Method for Classifying Staphylococci as of the "Food Poisoning" Type, Proc. Soc. Exper. Biol. & Med. 33: 185 (Oct.) 1935.

tests, since degenerate strains may be lacking in the Stone property. Whatever the result of this still controversial test, improved facilities for identification of food poisoning strains of staphylococci and their enterotoxic properties now seem imminent if not actually established. It must be remembered, however, that, in the words of Grubb,[10] "the mere demonstration that bacteria isolated from foods implicated in food poisoning outbreaks are capable of producing a toxin is not incontrovertible evidence that these bacteria caused the outbreak."

## Current Comment

### INCIDENCE OF SYPHILIS AND GONORRHEA

In some tabular sheets[1] recently released by the United States Public Health Service the rates per thousand of population for syphilis and gonorrhea have been given by states and cities for the fiscal year 1938 and the month of July 1938. The highest annual rate for syphilis was reported from Florida with 14.19 per thousand, followed by Mississippi with 13.26 per thousand. The rate for gonorrhea in Florida, however, was only 1.76 but for Mississippi was 14.61. The total lack of parallelism exhibited between the rates for syphilis and gonorrhea in these two states alone (it was also evident in the figures from many other states) may be safely interpreted as indicating wholly unsatisfactory reporting of the latter disease. Similar discrepancies are evident in the figures for cities with a population of 200,000 or over and in the summary figures for July. If apparent increase in gonorrhea occurs this unsatisfactory reporting must be taken into consideration.

### TOBACCO AND BLOOD PRESSURE

In an attempt to determine whether the change in blood pressure after smoking is due to the tobacco smoke or to other factors and whether the excessive rise in blood pressure occurs only in subjects who have a hyperreactive vascular system, Hines and Roth[1] have described the results of a standard smoking test. The subject is allowed to rest in a supine position in a quiet room for about thirty minutes or until the blood pressure and pulse rate reach a basal level. He then smokes two cigarets of a standard brand and during the smoking and for a few minutes afterward the blood pressure and pulse rate are observed. In order to determine the role of mechanical and emotional factors a control test is made by having the subject go through the same procedure except that an unlighted cigaret is puffed. These tests were performed on fifty-six patients with essential hypertension and thirty subjects with normal blood pressure. All the normal subjects were smokers but eleven patients who had essential hypertension had not smoked prior to the test. There was a rise in either systolic or diastolic blood pressures or both in most of the subjects tested, and the mean rise was of considerable amplitude. Response of blood pressure to the smoking test was similar to that to the cold pressor test except in the group of hyporeactors to the latter test. In the group of normal subjects only those who had an excessive response to the cold pressor test had an excessive response of the systolic and diastolic blood pressures to smoking. The mean rise in blood pressure was less in the control test, and in some instances there was even a fall in diastolic pressure. These observations were considered evidence that tobacco smoke was the main factor causing the rise in blood pressure but that excessive rises in blood presssure from smoking occurred only in the patients who had evidence of an inherently hyperreactive vascular system as measured by the cold pressor test. The effect of smoking tobacco on the blood pressure is apparently due not entirely to a nonspecific stimulus acting on a hyperreactive vascular system but at least in part to some element in the tobacco smoke which produces vasoconstriction.

### INTERNATIONAL NUTRITIONAL PROBLEMS

Among the interesting discussions of the sixteenth International Physiology Congress, recently held at Zurich, was that on international problems of nutrition. The general status of the subject was reviewed by Profs. Emil Abderhalden of Halle and Gaetano Quagliariello of Naples. Harriet Chick of London pointed out that Europe and Asia have a relative sufficiency of energy-providing foods but that they lack protective foods, such as those containing vitamins and mineral requirements. She pleaded for studies to find some system whereby the present world imbalance in food supplies might be equalized. Magee of London suggested that economic factors are not the only ones concerned in providing a more equable distribution of foods. He emphasized that there are many racial peculiarities in food habits which determine the preference of certain peoples for certain types of foods. Later he deplored the application of experimental work in the laboratory to mass problems of human nutrition. By reference to India, he illustrated the difficulties of attempting to apply to an "underprivileged" race standards of nutrition devised under ideal experimental conditions. Leake from San Francisco then suggested that biochemists might examine the logic of their recommendations in nutrition. Size and weight, he believed, are not necessarily either the only or the best criteria of biologic excellence. What are called "optimum standards" are frequently taken from those amounts which in experimental animals produce maximum effects. Among many biologists there is a feeling that longevity is frequently curtailed by rapid and excessive growth. That American nutrition experts are becoming aware of some of these considerations is shown by the recent review of Simmonds.[1] International discussions such as this one are helpful in more satisfactorily coordinating general world opinion on the important problems of human nutrition.

10. Grubb, T. C.: The Present Status of the Staphylococcus Food Poisoning Problem, J. Lab. & Clin. Med. 23:1150 (Aug.) 1938.

1. Public Health Service: Health Officers' Monthly Statement of Venereal Diseases Reported.

1. Hines, E. A., and Roth, Grace M.: The Effect of Tobacco on the Blood Pressure as Measured by a Standard Smoking Test, Proc. Staff Meet., Mayo Clin. 13:534 (Aug. 17) 1938.

1. Simmonds, Nina: Nutritional Corrections as an Aid in Overcoming Growth Defects in the Oral Structures, Internat. J. Orthodontia, to be published.

# ORGANIZATION SECTION

## AMERICAN MEDICAL ASSOCIATION AND INTERDEPARTMENTAL COMMITTEES TO CONFER ON NATIONAL HEALTH PROGRAM

At the special session of the House of Delegates of the American Medical Association held in Chicago September 16 and 17, at which the National Health Program proposed by the Interdepartmental Committee to Coordinate Health and Welfare Activities was considered, the House of Delegates authorized the Speaker to appoint a committee to confer and consult with proper federal representatives with respect to that program. The committee appointed by the Speaker was as follows:

| | |
|---|---|
| Dr. Irvin Abell, Chairman. | Dr. Frederic E. Sondern. |
| Dr. Walter F. Donaldson. | Dr. E. H. Cary. |
| Dr. Walter E. Vest. | and ex officio |
| Dr. Henry A. Luce. | Dr. Rock Sleyster. |
| Dr. Fred W. Rankin. | Dr. Olin West. |

The Secretary of the Association addressed communications to the President of the United States and to Miss Josephine Roche, chairman of the Interdepartmental Committee to Coordinate Health and Welfare Activities, informing them of the appointment of this committee.

On October 12 a gracious letter was received from the President expressing gratification that the American Medical Association desires to be of service to the federal government "in connection with the development of sound plans for the betterment of public health and future expansion of medical service." The President's letter further indicated that he was pleased to learn of the action taken by the House of Delegates with respect to the National Health Program and indicated his belief that progress in translating the recommendations of the Interdepartmental Committee into a practical program undoubtedly can be made by conference with the Association's committee. It was further stated in the President's letter that he had referred the letter received from the Secretary of the Association and the report of the Proceedings of the House of Delegates to the chairman of the Interdepartmental Committee with the suggestion that arrangements should be made for a conference.

On October 10 an equally gracious letter was received from Miss Josephine Roche, chairman of the Interdepartmental Committee to Coordinate Health and Welfare Activities, indicating that the Interdepartmental Committee feels "that early discussions with the special committee of the House of Delegates will be of great value in the development of practical programs of action directed toward the improvement of public health and medical service." Miss Roche further indicated that the Interdepartmental Committee, including the Technical Committee on Medical Care, would like to have a conference with the committee appointed on authorization of the House of Delegates. This conference will be held in Washington on October 31.

## AMERICAN MEDICAL ASSOCIATION STUDY OF MEDICAL CARE

### Vanderburgh County, Indiana

Vanderburgh County covers an area of 233 square miles in the extreme southwestern portion of Indiana and is seperated from Kentucky by the Ohio River. It had a population of 113,320 in 1930. Of the approximate 149,120 acres of land in Vanderburgh County, 81.9 per cent is in a rich agricultural district surrounding Evansville, which has a population of 102,249 and is the fourth city in size in the state. Evansville, founded in 1816 by General R. M. Evans, is a manufacturing and commercial city situated on a high bank of the Ohio River. The chief industries are the manufacture of flour, furniture and cigars. There is an extensive trade in coal, hardwood lumber and agricultural products, and within the vicinity of the city there are numerous coal mines.

The survey of Vanderburgh County was financed by a special assessment on the members of the county medical society and was supervised by a committee and directly conducted by a public accountant who was employed for four months. Each source of information was written in advance to inform it of the nature of the cooperation desired and was visited personally to interpret the various questions and insure uniformity in understanding and replying to the questions.

As a result of this preliminary action, 101 out of 134 physicians, or 75.37 per cent, and thirty-two of sixty-one dentists, or 52.46 per cent, filled out and returned the questionnaires. The most remarkable returns were those received from other sources than physicians and dentists. Questionnaires were sent to four hospitals, four nursing associations, two health departments, thirteen welfare and relief agencies, fifty-nine schools, one college, 303 other organizations and eighty-two pharmacists; every one of these 468 questionnaires was returned with the requested information. The fact that only one out of nine questionnaires was sent to a physician and that the responses from other sources were 100 per cent offers the most complete answer to the sneering remark of a speaker at the recent National Health Conference, who said:

> I do not myself feel much confidence in the result because I am not clear by precisely what method physicians are to know about the people whom they never see. The people who get no medical care obviously don't crowd the doctors' offices, and precisely how they are to arrive at figures which will be more convincing, if perchance we need any figures that are more convincing, is beyond the limits of my slow mind.

In considering reports of this survey one should keep in mind that information has been obtained from all organizations concerned in any significant way with medical care. Special efforts have been made to secure information from sources that might be supposed to have special information as to a lack of medical care

and might be disposed to criticize the attitude of the medical profession.

There are 134 physicians in active practice in Vanderburgh County, and no person is more than 8 miles from a physician. Nursing services are provided by 155 private duty nurses and twenty-three public health and visiting nurses. There are sixty-one dentists, eighty-two pharmacists and four hospitals. Of the latter, three are general and one is a hospital for tuberculosis; one is governmental, two are not for profit and one is private; these hospitals have a total of 582 beds, 145 of which are private and eighty-eight semiprivate, and 140 wards. There is a very exceptional condition as regards a quite uniform, high degree of occupancy in all types of hospital beds, the variation being only from 84.33 in semiprivate to 87.39 per cent of occupancy in wards. The ward rates vary from $2 to $3, and the private rates from $4 to $6.50.

Two clinics are operated by health departments and one is operated by "other organizations." One each of these clinics give the following types of service: maternity and child welfare, venereal diseases and dental. One private and twelve county (tax-supported) agencies arrange for or provide medical services. School health supervision services are under the control of the board of education and the Public Health Nursing Association. The one college in the county provides all types of medical service. There are seventeen plant arrangements for employees and eight for special groups of persons.

In 1937, 101 physicians who reported to the questionnaire stated that they had given free service during 1937 to 19,286 persons, and the thirty-two dentists who reported had given such service to 1,971 persons. In addition, 6,994 hours of service were given to the care of free ambulatory patients by physicians and 1,366 hours by dentists. The hospitals furnished 91,581 days of service to pay and part-pay patients, 15,795 to public charges and 40,860 days to free patients, while 9,777 patients made 18,276 visits to outpatient departments, clinics and dispensaries. Public nurses made 54,960 visits, of which 80.85 per cent were made without charge to the patients, and pharmacists compounded 20,216 prescriptions for which no charge was made and 5,850 at cost or reduced fees. Medicine for the indigent is provided principally by township trustees with the assistance of three small private societies. The ability of patients to pay for medical service is determined by investigation by hospitals and welfare and relief agencies.

With regard to hospital accommodations, the following comments are made:

We need twenty-five more hospital beds, especially for colored people. We have a ward, but no equipment as yet. This will probably be completed soon. What Evansville needs most is a general medical clinic. The tuberculosis clinic is oftentimes overcrowded because we have patients there who should not be there. Often patients who go there could go to a family doctor. As long as nurses make the selection this will continue.

Because of so high a percentage of bed occupancy, sixty-five patients needing hosptal care in 1937 could not be admitted, but no person needing medical service was turned away from the outpatient department.

Some of the comments of the nurses were as follows:

Doctors do a good job in fulfilling their duty answering calls practically 100 per cent whether there is pay or not.

That in smaller cities, such as Evansville, where clinics and hospitals are not needed for medical teaching purposes, with rare exceptions, no regular organized provision for adequate modern medical care is available to the underprivileged who are unable to purchase the service at the prevailing regulation rates. In consequence, many persons who are not at the moment suffering from an emergency type of illness must go without needed medical care. That what might be termed temporary emergency medical care is provided to indigents in Evansville through an older styled system of township trustee physician service. This service is a limited one. That some sort of modern set up is needed to provide necessary medical care for many adult citizens as well as children over the age of 6, who are ambulatory cases.

That the organized medical profession through progressive, cooperative leadership be the group to plan, devise and organize a modern agency to provide medical care to those in the community who cannot avail themselves of the needed service at the prevailing rates charged (which the private practitioner must charge if he is to exist) and at the prevailing rate of income of our large industrial population.

The total number of persons who were unable to obtain either medical, dental, nursing or hospital care is reported as eleven.

Of the 101 physicians from whom replies were received, sixty-eight stated that they had performed preventive medical services in private practice, thirty-seven said that they had done such work for health departments and twenty-seven that they had done such work for other agencies. Of course this includes some duplications, where physicians gave such service under all three conditions. No births were unattended by a physician or midwife, but 46.42 per cent of obstetric patients waited until after the third month of pregnancy before they consulted their physician. The county medical society has collected, as far as possible, from every organization having plans and arrangements for providing medical service or cash benefits for medical care material describing such arrangements but has not yet undertaken any specific plan of its own.

Further information contained in comments shows that $16,560 was paid to doctors, $43,027 to hospitals, $18,048 for drugs, and $30 for nurses, or a total of $77,665, by the township trustees. In addition, the county department of public welfare expended $9,266.

Among the recommendations by physicians, some of which are repeated several times, is the establishing of a free clinic for indigents to which physicians, in rotation, should give a certain amount of free service. Others suggest some form of hospital insurance or the building and maintaining of a joint county-city hospital. Another says: "We need our setup for x-ray and radium therapy of malignancy in the lower income groups," and another adds that there is need of "more extensive facilities for pneumonia-serum taking and serum available at a greatly reduced cost." Several declare, in substance, that all legitimate needs are now adequately taken care of or report that they have not heard any complaints. There is some complaint of politics and red tape and of a lack of organization; also, that "lodge practice, insurance and compensation work, mutual aid groups and similar organizations tend to encourage contract practice." It is probably a dentist who suggests "trailer traveling portable dental social service care with dental assistant aiding dentist." There are two who urge greater use of Negro physicians and Negro public health nurses in the care of the Negro sick. A full time health officer is suggested by several physicians, and one states that "I am of the opinion that the township and county physicians should be discontinued. The patient should be allowed to

choose the physician and the county should pay such physician a moderate fee." The following criticisms were also made:

Friends or relatives of indigents will not cooperate sufficiently to visit the necessary agencies to see about funds and services. Emergencies exist at all hours of the day and night and frequently it is impossible to serve authorization at these hours.

Frequently the methods are too complicated in order to insure indigent care. There is also frequently a lack of proper investigation; by this I mean indigent county patients all too frequently have new automobiles and all electrical appliances at home.

The medical association itself should work out some form of health insurance, to include doctor fees and hospital bills only, and present it to a reliable insurance company for sale to (1) the public who can buy it, (2) relief agencies supporting certain people, and (3) other governmental agencies. This insurance must not specify certain doctors or certain hospitals, but trust all certified and qualified M.D.'s the same.

These are but sample comments out of—as near as can be determined—some eighty to 100 comments or recommendations from physicians and dentists, which show the close interest and cooperation of the doctors in the study.

Especially significant to the medical profession are the comments from the welfare and relief agencies, because they represent an outside opinion; these are therefore given in full:

I feel that the doctors and hospitals here do a fine piece of work, and the care is adequate.

We feel that we should have a city hospital or additions to the hospitals already here. Some provision should be made for contagious and communicable diseases.

Better and more adequate care for colored patients.

Need an iron lung. Full time health officer.

I feel that care is adequate.

Doctors' fees are quite reasonable.

I believe the patient should pay back half the cost of his hospital bill or doctor bill after he gets back to work.

Hospital fees are too high. People would go to hospitals for necessities if the fees were more reasonable.

Doctors' fees should be lowered to a plane that the poorer people could pay for and enjoy better health by receiving the care they need.

We need a city and county hospital combined that will also house all the clinics with full time doctors to take care of it.

I feel that the care is adequate, and the people are well served.

Lower rates are an absolute necessity and would do more good to solve the problem than anything else.

I feel that this city is large enough to support a city hospital.

I feel all welfare departments should be combined under one head.

The following comment from a school authority is helpful in outlining some phases of the local situation:

Reports continually come in from nurses, teachers, and social workers of children where parents are not able to provide medical and dental care for them. It is pointless and would be an unwise expenditure of effort unless there were some assurance of eventual attention to determine whether the reports are true or not. WPA wages and equally low incomes from industry, with a large number of dependents per family, is usually reasonable justification for assuming many reports to be true. A small amount of dental reparative work, a few tonsillectomies and refractions for outstandingly needful cases have been possible recently.

Several pharmacists suggest a clinic or additional hospital services, and one thinks that "indigent and low income groups should be taken care of through a good plan, with political aspects abolished, and turned over to medical society." There are a number of pharmacists whose opinions may be summed up in the statement of one of them that "doctors should be left alone to practice as they always have." Several others complain of political influence in the distribution of medical care to the indigent.

## OFFICIAL NOTES

### RADIO BROADCASTS

The fourth series of programs broadcast in dramatic form portraying fictitious but typical incidents of significance in relation to health by the American Medical Association and the National Broadcasting Company entitled "Your Health" began Wednesday, October 19, and will run consecutively for thirty-six weeks. The program is broadcast over the Blue network of the National Broadcasting Company each Wednesday at 2 p. m. eastern standard time (1 p. m. central standard time, 12 noon mountain time, 11 a. m. Pacific time).*

These programs are broadcast on what is known in radio as a sustaining basis; that is, the time is furnished gratis by the radio network and local stations and no revenue is derived from the programs. Therefore, local stations may or may not take the program, at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

The programs to be broadcast in the first group, together with their dates and their topics, are as follows:

October 26. Growing Strong.†
November 2. Seeing and Hearing Well.
November 9. Healthier Boys and Girls.

* Owing to program conflicts, there will be no Chicago broadcast of the network program. Instead, a recording of the program will be broadcast over Station WENR at 8 p. m. each Wednesday. This recording will be an identical rebroadcast of the network program broadcast earlier the same day.

† Program may be canceled; attempting to arrange an evening program.

## WOMAN'S AUXILIARY

### Pennsylvania

The annual session of the auxiliary to the Medical Society of the State of Pennsylvania was held October 3-6 at Scranton.

Conferences were held with county presidents and chairmen of archives, history, *Hygeia* and public relations, with Mrs. Walter F. Donaldson, incoming president, presiding.

At the formal opening, October 4, Dr. Thomas G. Killeen, president, Lackawanna County Medical Society, gave an address of welcome. Following the business session, the annual luncheon was held with Mrs. David W. Thomas, second vice president of the auxiliary to the American Medical Association, presiding. The speakers were Dr. Frederick J. Bishop, Dr. David W. Thomas, Dr. Walter F. Donaldson, Dr. Walter S. Brenholtz, and Dr. Frank C. Hammond.

At the afternoon session, Mrs. Augustus S. Kech gave an address on auxiliary work. A banquet honoring past state presidents was held at Hotel Casey. Dr. Howard C. Frontz, chairman, committee on Medical Benevolence of the Pennsylvania State Medical Society, reported to its house of delegates that the women's auxiliaries of Pennsylvania have contributed $4,516.85 to the Benevolence Fund during the past twelve months.

# Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

## CALIFORNIA

**Campaign Against Deafness.**—California has been divided into eleven geographic areas with a district chairman, each of whom operates under a supervising state director, as an extension of the educational campaign to prevent impairments of hearing under way in the state for almost five years. Dr. Francis L. Rogers, Long Beach, is state director; Dr. Dewey R. Powell, Stockton, section chairman, and the following are the district chairmen:

Dr. Joseph Roy Jones, Sacramento, district 1.
Dr. Charles A. Brandtzen, Stockton, district 2.
Dr. Dorothea Lee, San Jose, district 3.
Dr. Harold A. Fletcher, San Francisco, district 4.
Dr. George W. Walker, Fresno, district 5.
Dr. Joseph D. Lewis, Santa Barbara, district 6.
Dr. Isaac H. Jones, Los Angeles, district 7.
Dr. Harold D. Smith, Pomona, district 8.
Dr. Ray M. Moose, San Bernardino, district 9.
Dr. Ben K. Parks, Long Beach, district 10.
Dr. Frank A. Burton, San Diego, district 11.

**Society News.**—The Los Angeles Cancer Society was addressed October 21 by Drs. Alson R. Kilgore, San Francisco, on breast tumors; William H. Sargent, Oakland, "Treatment of Superficial Cancer"; William H. Daniel, Los Angeles, "Surgery of Rectal Cancer" and John H. Lawrence, Berkeley, "Neutrons and Artificial Radioactive Substances."——The first fall meeting of the Trudeau Society of Los Angeles will be addressed October 25 by Drs. James Steinberg, Maxwell T. Lipman and Julius L. Samuels, all of Los Angeles, and Joseph Rosenblatt, Duarte.——Dr. Arthur Elmer Belt, among others, addressed the Los Angeles Surgical Society October 14 on "New Approach Through the Perineum to the Posterior Aspect of the Prostate."——Henry Borsook, Ph.D., professor of biochemistry, California Institute of Technology, and Dr. Edward D. Kremers, physician to students at the institute, presented a summary of the practical aspects of the vitamin situation before the Hollywood Academy of Medicine October 13.

## CONNECTICUT

**Public Health Meeting.**—The Connecticut Public Health Association held a public health meeting September 21 at the Brady Memorial Auditorium, New Haven, with Dr. Wilmarth Bradford Walker, health officer of Cornwall, as the speaker. His subject was "How Towns Can Organize for Public Health." The meeting was open to the public.

**Committee on Industrial Health.**—Dr. Clifford Kuh, New Haven, has been appointed chairman of a recently created committee on industrial health of the Connecticut State Medical Society. Other members are Drs. William A. Sunderland, Danbury; Richard O'Brien Shea, Bridgeport; Benedict N. Whipple, Bristol; Donald B. Wells, Hartford; John Purney, New Britain; Paul W. Vestal, New Haven; John S. Dye, Waterbury; Cole B. Gibson, Meriden.

## GEORGIA

**Cancer Treatment Centers.**—New state aid cancer treatment centers have been established at Dalton and Savannah, bringing the total number of these centers now in operation to ten. According to *Georgia's Health*, applications for state aid in the treatment of cancer are being received at about an average rate of seven a day.

**Society News.**—Dr. Wiley M. Flanagin, Waycross, addressed the Ware County Medical Society, Waycross, August 3, on treatment of typhoid.——At a meeting of the Tri-County (Calhoun, Early and Miller counties) Medical Society August 18, the speakers were Drs. George O. Gunter, Blakely, on "Malaria, Prophylaxis and Treatment"; William H. Wall, Blakely, "Sulfanilamide, Its Uses and Abuses," and James A. Redfearn, Albany, heart disease.

**Hall of Health for Atlanta Fair.**—The Fulton County Medical Society sponsored a "Hall of Health" at the Southeastern Fair in Atlanta October 2-9. Contributors included the Medical Association of Georgia, the American Medical Association, the health departments of the state, Fulton County and Atlanta, the Georgia and Atlanta tuberculosis associations, the fifth district dental, nursing and pharmaceutical societies, the Atlanta Hospital Association and the Atlanta Dietetic Association. The Fulton County society displayed the work of famous physicians of Georgia, among other features.

## ILLINOIS

**Past Presidents' Night.**—The Peoria City Medical Society held a dinner October 13 at the Pere Marquette Hotel in honor of its past presidents. Representative Everett Dirksen, as the principal speaker, discussed "The Present Day Status of Medicine in Congress." Twenty-seven former presidents of the society attended.

### Chicago

**Dr. Best to Address Institute of Medicine.**—Dr. Charles H. Best, professor of physiology, University of Toronto Faculty of Medicine, Toronto, will address a joint meeting of the Institute of Medicine of Chicago and the Chicago Society of Internal Medicine at the Palmer House Friday evening at 8 o'clock, October 28, on "Heparin and Thrombosis."

**Society News.**—Speakers before the Chicago Laryngological and Otological Society October 3 were Drs. Thomas C. Galloway, Evanston, Ill., on "Postural Treatment in Acute Laryngotracheobronchitis"; Francis L. Lederer, "Early Diagnosis and Treatment of Laryngeal Carcinoma," and Joseph C. Beck, "Living Patients with Laryngectomies—Instruments for Otolaryngeal Diagnosis."

**New Quarters for Social Hygiene Clinic.**—Expanded facilities for the Municipal Social Hygiene Clinic are provided in new quarters to which the clinic has recently been moved. The first floor of the building remodeled for the purpose is for women, the second for men, with Dr. Cornelius E. Healy as chief clinician. On the third floor are laboratories for the clinic and facilities for outside activities, including epidemiology, physicians' reports, requisitions for drugs, follow-up and field work for other clinics. Laboratory work for private physicians and other clinics is done in the main laboratories of the city board of health.

**Food Poisoning Attributed to Tainted Pastry.**—About 500 cases of food poisoning with two deaths have occurred in Chicago and the suburb of Elmwood Park in an outbreak attributed to contaminated pastry from a bakery. Cases were first reported from Elmwood Park in newspapers of September 16. The Chicago board of health has investigated 121 cases within the city limits of Chicago and has found a history of eating pastry in about two thirds of them. The board of health of Elmwood Park and the state public health laboratory are investigating the cases in the suburb. The state laboratory announced September 21 that the paratyphoid bacillus was suspected of causing some of the cases, since the bacillus had been identified in several of the specimens. The Chicago department of health made a house to house canvass in the area of Chicago adjacent to Elmwood Park covering nearly three square miles, while the state and local departments of health cooperated in a similar survey in the suburb.

## INDIANA

**Graduate Education Meeting.**—The Indiana State Medical Association, the Third District Medical Society and the Orange County Medical Society sponsored a graduate course at French Lick, September 7-8. The following program was presented:

Dr. Carl P. Huber, Chicago, Obstetrics in General Practice.
Dr. Alfred R. Shands Jr., Wilmington, Del., Common Clinical Orthopedics in Children.
Dr. Isidor H. Tumpeer, Chicago, Pediatric Adventures in Allergy.
Dr. Bernard Fantus, Chicago, The Role of the Spa in Therapy.
Dr. Richard Kovacs, New York, Use of Physical Therapy by the General Practitioner.
Dr. Walter S. McClellan, Saratoga Springs, N. Y., Recent Advances in the Therapeutic Application of Plain and Mineral Waters.
Dr. Madge C. L. McGuinness, New York, Physical Treatment in Gynecologic Conditions.

At the dinner meeting Wednesday evening the speakers were Drs. Emmet F. Horine and Arthur T. McCormack, both of Louisville, Ky., whose subjects were respectively "Prevention of Paroxysmal Dyspnea" and "Medical Practice and Public Health." Internal medicine and therapeutics and surgery and orthopedics were the subjects discussed at round table luncheons Thursday.

## IOWA

**Iowa Requires Citizenship of Foreign Graduates.**—At a meeting of the state board of medical examiners in Des Moines September 9, a resolution was adopted requiring all applicants to practice medicine in Iowa coming from foreign medical colleges, exclusive of Canada, to furnish certified evidence that they have full citizenship in the United States.

**Society News.**—Dr. James B. Knipe, Armstrong, addressed the Emmet-Dickinson County Medical Societies August 18 in Estherville on spinal injuries.——The Wayne County Medical Society was addressed August 11 by Dr. Elias B. Howell, Ottumwa, on fractures.——At a meeting of the Des Moines Academy of Medicine and Polk County Medical Society in Des Moines September 27 the speakers were Drs. Henry G. Decker and Herman J. Smith on "Clinical Significance of Spinal Puncture" and "Coarctation of the Aorta" respectively. ——Dr. James S. McLester, Birmingham, Ala., discussed "The Clinical Aspects of Nutritive Deficiency" before the Linn County Medical Society, Cedar Rapids, September 15.

## LOUISIANA

**Society News.**—A joint scientific and third quarterly executive meeting of the Orleans Parish Medical Society was addressed October 10 by Drs. Oscar W. Bethea, New Orleans, on "The Analysis of the History in the Diagnosis of Gastric Disease" and Donovan C. Browne, New Orleans, "Gastroscopy."

**Graduate Clinics.**—The faculty of Tulane University of Louisiana School of Medicine, New Orleans, through the department of graduate medical studies, will present courses on medicine and surgery and their branches October 24-29. The mornings will be devoted to clinics and the afternoons to fifteen minute talks with five minutes between lectures for questions and answers.

## MAINE

**State Clinical Session.**—The Maine Medical Association will hold its annual clinical session at the St. Mary's and Central Maine general hospitals, Lewiston, November 3-4. A dinner at the DeWitt Hotel Thursday evening will be addressed by Dr. Dennett L. Richardson, superintendent, Charles V. Chapin Hospital, Providence, R. I., whose subject will be "Contagious Disease Hospitals."

**Society News.**—Dr. Fred A. J. Geier, Washington, D. C., addressed a recent meeting of the Hancock County Medical Society, Bar Harbor, on "Criteria for Early Diagnosis of Cancer of the Stomach."——The Kennebec County Medical Association was addressed in Waterville September 15, among others, by Drs. Theodore E. Hardy on "Chronic Glomerular Nephritis" and Ovide F. Pomerleau, "Spinal Meningitis Treated with Sulfanilamide."——A recent meeting of the Somerset County Medical Society was addressed by Homer W. Smith, Sc.D., professor of physiology, New York University, on "Recent Studies in Renal Physiology."——Dr. Gilbert E. Haggart, Boston, discussed problems in bone and joint surgery before the Oxford County Medical Society in Bethel October 18.

## MASSACHUSETTS

**Personal.**—A testimonial dinner was held in honor of Dr. Henry D. Chadwick, Boston, September 8; he has resigned as state health commissioner to become medical director of the Middlesex County Sanatorium at Waltham.

**Cancer Clinic.**—The regular Lawrence Cancer Clinic in Lawrence October 4 was a demonstration and teaching clinic for physicians with Dr. Channing C. Simmons, associate in surgery in courses for graduates, Harvard Medical School, Boston, as consultant. Physicians of the north half of Essex County were invited to bring their patients. A report is to be returned to every physician who sent a patient.

## MICHIGAN

**Physician Honored.**—Dr. Amos S. Wheelock, Goodrich, an honorary member and past president of the Genesee County Medical Society, was honored by the people of Goodrich recently to observe his completion of fifty years of practice in the community. William J. Putnam gave the welcoming address; Judge Edward Black, Flint, was the principal speaker. Dr. Wheelock graduated at the University of Michigan Medical School, Ann Arbor, in 1888.

**Rabies Committee Appointed.**—A joint committee on the control of rabies in Michigan has been appointed to seek ways and means to curb the recent outbreak of rabies, which has caused two deaths. Members of the committee include Assistant Attorney General John F. Young; Dr. Filip C. Forsbeck, Lansing, director, bureau of epidemiology, state department of health; Dr. Herbert W. Emerson, director of the Pasteur Institute, Ann Arbor; C. H. Clark, state veterinarian, and Dr. Joseph A. Kasper, director of the laboratories of the Detroit health department. The committee represents the state department of health, the department of agriculture and the attorney general's office.

**Graduate Course on the Specialties.**—The department of graduate medicine of the University of Michigan Medical School, in conjunction with the Wayne University College of Medicine and the state medical society, announces the annual extramural graduate course for 1938-1939. The course has been divided into two parts, the first to be given in October 1938 and the second in April 1939. Surgery, dermatology and syphilology, internal medicine, including a symposium on tuberculosis, and psychiatry will be covered during the October session at the following teaching centers: Ann Arbor, Battle Creek-Kalamazoo (jointly), Flint, Grand Rapids, Lansing-Jackson (jointly), Manistee-Traverse City-Cadillac-Petoskey (jointly), Marquette and Saginaw.

## MINNESOTA

**Personal.**—Isaac M. Kolthoff, Ph.D., professor of analytic chemistry and head of the department of chemistry at the University of Minnesota, Minneapolis, was made an officer of the Order of Oranje-Nassau by Queen Wilhelmina of Holland August 31.——Dr. John Esser, Perham, has been appointed a member of the state board of health to succeed Dr. Samuel Z. Kerlan, Aitkin; Dr. Albert G. Schulze, St. Paul, has also been appointed a member.

**Mayo Foundation House Dedicated.**—The residence of Dr. and Mrs. William J. Mayo, Rochester, was dedicated September 23 "as a meeting place where men of medicine may exchange ideas for the good of mankind." The residence, now known as the Mayo Foundation House, and the east half of the block on which it stands was deeded about a year ago to the foundation together with sufficient endowment for its maintenance. The activities carried on there will be for medical education in its broadest sense and particularly with the view of fulfilling the purposes of the Mayo Foundation for Medical Education and Research.

**Society News.**—Dr. Philip Manson-Bahr, London School of Hygiene and Tropical Medicine, gave a Mayo Foundation lecture September 8 in Rochester on "Differential Diagnosis of Dysentery and Colitis."——Dr. Oscar F. Mellby, Thief River Falls, was elected president of the Northern Minnesota Medical Association at its annual meeting in Crookston August 29-30. Dr. Charles W. Simison, Hawley, was elected vice president and Dr. Clarence Jacobson, Chisholm, reelected secretary-treasurer. Among the speakers were Drs. Ernest M. Hammes, St. Paul, on newer aspects of neurology and psychiatry, and Edward L. Tuohy, Duluth, on the present status of vitamin and hormone therapy.

## MISSOURI

**Annual Campaign Against Diphtheria.**—The fourth annual campaign against diphtheria is under way in St. Louis under the auspices of the health division of the city department of public welfare. During the first eight months of 1934, before the first campaign, 584 children in St. Louis developed diphtheria and twenty-two of them died. During the first eight months of 1938 there were 128 cases and two deaths, representing a decrease of 78 per cent in the number of cases and 90 per cent in the number of deaths. Of the number of children who died in 1937 of diphtheria 94 per cent had not been immunized with toxoid or tested for immunity, it is reported.

**The Ellis Fischel Cancer Hospital for Indigents.**—Construction is expected to begin soon on the Ellis Fischel Cancer Hospital for Indigents in Columbia, which has been made possible through an appropriation of $500,000. Later $409,090 was granted the state cancer commission by the public works administration, making a total of $909,090 for the construction and equipment of the hospital on a forty acre tract of land on highway 40 in Columbia, which gave the site to the cancer commission. The building will consist of seven stories and a penthouse, offering an approximate capacity of eighty-three beds. The hospital will be named for Dr. Ellis Fischel, who at the time of his death on May 14 was chairman of the state cancer commission.

## NEW JERSEY

**Society News.**—Dr. Edward Weiss, Philadelphia, addressed the Camden County Medical Society, Camden, October 4, on "Recent Advances in Our Understanding of High Blood Pressure."——Dr. George A. Harrop, director of the Squibb Institute for Medical Research, New Brunswick, addressed a stated meeting October 20 on "Recent Advances in Our Knowledge of the Adrenal Glands."——Dr. Edward J. G. Beardsley, Philadelphia, addressed the Hudson County Medical Society, Jersey City, October 4, on "Clinical Demonstration of the Value of Routine Surgical Examination."

**Fund Being Raised for Seashore House.**—Funds for a new building for the Children's Seashore House at Atlantic City for Invalid Children are being raised by public subscription in Atlantic City, Philadelphia and surrounding communities. The new building will cost about $1,250,000 and will have 420 beds. Wings will be especially constructed to allow wide areas of space for sun pavilions and a physical therapy department will be included in the new equipment to be added. An outdoor warm salt water pool will occupy the central foreground near the Boardwalk. Children's Seashore House receives convalescent, underprivileged and crippled children from hospitals and social agencies in New Jersey, Pennsylvania, Delaware and Maryland. Dr. Edward Z. Holt, Atlantic City, is medical director and Dr. Arthur Bruce Gill, Philadelphia, is head of the consulting medical staff.

## NEW YORK

**Personal.**—Dr. Halsey J. Ball, health officer of the Utica district, including Herkimer, Madison and Oneida counties, retired from active service September 1, having reached the retirement age. He had been associated with public health work since 1892.

**Typhoid in Resort Hotels.**—Outbreaks of typhoid were reported in two resort hotels in upstate New York during the summer. In one case the drinking water from the hotel was taken from a well within ten feet of a sewer line. Examination of food handlers revealed that a waitress who had had typhoid as a child was harboring typhoid bacilli. She had begun work twelve days before the outbreak, in which twelve cases developed. In the second outbreak, the hotel cook was found to have had gallbladder attacks but had no knowledge of having had typhoid; the bacilli were found, however, on examination. Eleven cases occurred in this group.

**District Meetings.**—The annual meeting of the Fifth District Branch of the Medical Society of the State of New York was held in Syracuse October 6. A feature of the meeting was a luncheon in honor of Dr. William A. Groat, Syracuse, president of the state society, with Dr. Nathan B. Van Etten, New York, as the guest speaker. Among the speakers on the scientific program were Drs. Russell L. Haden, Cleveland, on "Mechanism of Anemia"; Herman O. Mosenthal, New York, "Protamine Zinc Insulin—Results of Its Prolonged Use" and Wendell D. George, Watertown, "Puerperal Infections, with Special Reference to the Use of Sulfanilamide." ——The Eighth District Branch of the Medical Society of the State of New York held its annual meeting October 4 at the Buffalo City Hospital. The guest speakers were Drs. Walter A. Bastedo, New York, on "Stomach Remedies New and Old" and William P. Murphy, Boston, "Fact and Fiction in the Treatment of Deficiency Diseases."

### New York City

**University News.**—Richard E. Scammon, LL.D., distinguished service professor, Graduate School of the University of Minnesota, lectured before the New York University Chapter of Sigma Xi September 23 on "The Universalist Tendency in Seventeenth Century Science and Medicine as Exemplified by the Activities of the Versatile Dr. Petty."

**Annual Dinner of Cancer Committee.**—The New York City Cancer Committee will hold its annual dinner November 1 at the R. C. A. Building, Rockefeller Center, November 1. Dr. John C. A. Gerster, chairman of the committee, will preside; Dr. John J. Morton Jr., Rochester, N. Y., will present the greetings of the American Society for the Control of Cancer, and Mrs. Robert G. Mead, chairman of the society's committee on award, will present the Clement Cleveland Memorial Medal. The guests will then adjourn to the New York Museum of Science and Industry for a preview of the cancer exhibit prepared for the New York World's Fair. Addresses will be made by Louis I. Dublin, Ph.D., third vice president, New York Life Insurance Company; Mr. Robert P. Shaw, director, New York Museum of Science and Industry, and Dr. Francis Carter Wood, director of the Institute of Cancer Research, Columbia University.

**Association of Allergy Clinics.**—The first open meeting of the Association of Allergy Clinics of Greater New York will be held November 10 at New York University School of Medicine with "Hay Fever—Its Diagnosis and Treatment" as the subject of discussion. Allergy clinics of the following hospitals will participate: Bellevue Hospital, under the direction of Dr. Aaron Brown; the third pediatric division of Bellevue, Dr. Samuel D. Bell; New York Hospital, Dr. Horace S. Baldwin, and the New York Eye and Ear Infirmary, Dr. James H. Barnard. This association was formed several months ago and now has seventeen clinics as members. Only those have been accepted whose facilities, personnel and procedures had already been examined and approved as fulfilling the minimal requirements for allergy clinics established by the conjoint standards committee of the Society for the Study of Asthma and Allied Diseases and the Association for the Study of Allergy. Dr. Robert A. Cooke is chairman of the association and Dr. Robert Chobot is secretary.

## NORTH CAROLINA

**Services for Crippled Children.**—The state board of health recently reported that about 12,000 children have been registered for examination, treatment or hospitalization by the crippled children's division since the division was established in April 1936, following the passage of the Social Security Act. Eighteen clinics have been organized, in many cases with support from local civic organizations. About 9,000 children have been admitted to these clinics for diagnosis or treatment. Arrangements were also made with eighteen general hospitals in the state, which provide about 100 beds in addition to the 150 beds at the State Orthopedic Hospital at Gastonia. During the two years the plan has been in operation there have been 1,784 cases authorized for admission to the general hospitals and 750 to the state orthopedic hospital. The field staff has attended 442 day clinics, resulting in contact with more than 7,000 patients. During the fiscal year ended June 30, the division expended $216,000. This included $114,000 state funds; $96,000 from the Social Security Board through the Children's Bureau and $6,000 contributed by civic and patriotic organizations.

## OREGON

**Society News.**—The Lake County Medical Society was recently organized with Drs. Charles E. Leithead as president and Joycelin H. Robertson, secretary. Both are of Lakeview.

**New Health Officers.**—Dr. Peter H. Rosendal, formerly of Lake Preston, S. D., has been appointed health officer of Klamath County. Other recent appointments are Coos County, Dr. Charles L. Coyle, Marshfield; Multnomah County, Dr. Frederick Sydney Hansen, formerly of Pendleton, and Umatilla County, Dr. Alfred H. MacLaren, formerly of Portland.

## PENNSYLVANIA

**Negro Institute for Health Education.**—A group of Negro physicians and dentists recently organized the Pennsylvania Institute of Negro Health under the leadership of Dr. Frederick M. Hopkins, Philadelphia, it is reported. Purposes of the organization are to disseminate health information among Negroes, to sponsor projects which will lead to the formation of health habits by Negro children and to interpret the aims of Negro physicians and dentists of the state, it was stated. Cooperation with city and county health departments and with the state department of health is planned.

## SOUTH DAKOTA

**Personal.**—Dr. Antony Triolo, formerly of Philip, has been appointed health officer of Pennington County, succeeding Dr. Horace D. Lien, Rapid City, who has resigned to join the staff of the Fort Bidwell Hospital, Fort Bidwell, Calif.

## TENNESSEE

**Society News.**—At a meeting of the Dyer, Lake and Crockett Counties Medical Society September 7 the speakers, all of Memphis, were Drs. James E. Wilson, on "Ophthalmology for the General Practitioner"; Sam L. Raines, "Management of Ureteral Stones," and Clyde V. Croswell, "Suggestions for the Preschool Child."——Dr. Robert S. Cowles, Greeneville, addressed the Greene County Medical Society, Greeneville, September 6, on paratyphoid fever.——Drs. John B. Haskins and John Alexander Steward, Chattanooga, addressed the Hamilton County Medical Society, Chattanooga, September 15, on "Congenital Hypertrophic Stenosis in Infancy" and "Physiology and Surgery of the Sphincter" respectively.——At a meeting of the Shelby County Medical Society September 6, the speakers included Dr. Carrol C. Turner, Memphis, on "The Use of Metrazol in the Treatment of the Psychoses."——Dr. Walter D. Hankins, Johnson City, addressed the Washington County Medical Society, September 1, on "Roentgen Therapy in Infections and Malignant Diseases" and Dr. Edmund A. Lodge, Mountain Home, discussed cases of diseases of the eye, ear, nose and throat.

## GENERAL

**Hazards of the Hunting Season.**—Analysis of 133 deaths in shooting accidents among hunters which occurred in industrial policyholders of the Metropolitan Life Insurance Company from 1935 to 1937 revealed three main groups of these fatalities, the *Statistical Bulletin* reports. Deaths resulting from self-inflicted wounds accounted for sixty, or 45 per cent, of the total number. Accidental shooting by a hunting companion was responsible for forty-eight, or 36 per cent. Nineteen persons were killed by hunters in other parties than their own; five were killed while resting by the accidental discharge of their guns set against rocks and trees, and one hunter was shot by a farmer who mistook him for a prowler. It is estimated that of nearly 3,000 persons killed each year in accidents with firearms about a third are hunters afield.

**Premarital Blood Tests Required in Eight States.**—Eight states now require premarital blood tests for both brides and bridegrooms before issuance of licenses to marry, according to a survey by the Council of State Governments reported in the New York *Times* October 3. New Hampshire became the eighth state October 1 when its law became effective. Other states are New Jersey, New York, Rhode Island, Connecticut, Illinois, Michigan and Wisconsin. Of the group, Rhode Island and Wisconsin are the only two with measures designed to prevent evasion of their laws. The Rhode Island law requires that residents married in other states who return to live in Rhode Island must, within six months, submit to physical examinations including blood tests. Residents of Oregon will decide in the November election whether its law shall apply to both men and women; at present only men are required to take premarital physical examinations.

**Medical Care to Be Discussed in Newspaper Forum.**—Care of the sick will be discussed in the eighth annual Forum on Current Problems sponsored by the New York *Herald Tribune* October 25-27. The discussion of medical care will be part of a session in the afternoon of October 25 on the general theme "Shall We Break with Tradition?" Robert A. Millikan, Ph.D., chairman of the executive council of California Institute of Technology, Pasadena, will deliver a keynote address and the following speakers will participate on the discussion:

Dr. Richard C. Cabot, professor of clinical medicine, emeritus, Harvard Medical School, Boston.
David McAlpin Pyle, New York, president of the United Hospital Fund.
Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL.
W. C. Kirkpatrick, president of the Group Health Association, Washington, D. C.
Miss Josephine Roche, chairman of the Interdepartmental Committee to Coordinate Health and Welfare Activities, Washington, D. C.
Miss Esther Lape, member in charge of the American Foundation, New York.

This program will be broadcast over the facilities of the National Broadcasting Company.

**Academy of Physical Medicine.**—The sixteenth annual meeting and scientific session of the Academy of Physical Medicine will be held at the Willard Hotel, Washington, D. C., October 24-26. Among others, the following will speak:

Dr. Isi Gunsburg, Antwerp, Treatment of Hepatic Insufficiency by Physical Medicine.
Dr. Winfred Overholser, Washington, The Value of Physical Therapy in the Treatment of Mental Diseases.
Dr. Allen P. Voshell, Baltimore, Treatment of Poliomyelitis During the Postparalytic Stage.
Dr. Fred H. Albee, New York, Surgical Lengthening of the Top of the Femur in Anterior Poliomyelitis.
Dr. Josef B. Nylin, Philadelphia, Physical Exercise in Cardiac Condition.
Dr. Benedict F. Boland, Boston, Lesions of the Uterine Cervix and Their Treatment by Electrosurgical Methods.

A public session Monday evening will be addressed, among others, by Dr. Rolland A. Case, Cleveland, president, on "Advances in Physical Medicine." At the round table luncheon Tuesday the theme will be "Electrical Brain Waves and Emotion in Man" with the following speakers: Hudson Hoagland, Ph.D., Dr. Donald Ewen Cameron and Morton A. Rubin, Ph.D., all of Worcester, Mass. The program also includes symposiums on radiant energy and fever therapy. Dr. Case will be master of ceremonies at the annual banquet Tuesday evening. In tribute to Dr. R. Tait McKenzie, who at the time of his death in April was the president of the Academy of Physical Medicine, an exhibit of rare bronzes, the work of Dr. McKenzie, will be shown.

**International Congress of Military Medicine and Pharmacy.**—The tenth International Congress of Military Medicine and Pharmacy will be held in Washington May 7-15, 1939, with Major General Charles R. Reynolds, surgeon general of the U. S. Army, as president. Registration is open to all officers of the medical services of the army, navy, air and colonial services, national guard, territorial forces and public health service, both active and reserve. Subjects proposed for discussion are as follows: organization and function of the medical services in colonial expeditions, probable casualties in war and methods of calculation, practical procedures for anesthesia and analgesia in war surgery, organization and function of the military chemicopharmaceutic service, emergency treatment and primary apparatus for fractures of the jaws in war, technical specialization of administrative officers in the medical service, and oxygen therapy and its practical use with troops on active service. Col. Harold W. Jones, Army Medical Corps, is secretary general of the congress, with headquarters at the Army Medical Library, Washington, D. C.

**Delegates to Conference on Nomenclature.**—Delegates from the United States to the International Commission for Decennial Revision of the International List of Causes of Death in Paris October 3-9 included the following:

William Thurber Fales, Sc.D., director, bureau of vital statistics, Baltimore Health Department.
Dr. William J. V. Deacon, director, bureau of vital statistics, Michigan State Department of Health, Lansing.
Mr. Thomas J. Duffield, director, bureau of vital statistics, New York City Department of Health.
Dr. Halbert L. Dunn, chief statistician, division of vital statistics, U. S. Bureau of the Census, Washington, D. C.
Selwyn D. Collins, Ph.D., statistician, U. S. Public Health Service, Washington.
Dr. Edwin F. Daily, Children's Bureau, U. S. Department of Labor, Washington.
Dr. Haven Emerson, professor of public health practice, Columbia University College of Physicians and Surgeons, New York.
Mr. George H. Van Buren, general supervisor, Metropolitan Life Insurance Company, New York.
Dr. George Baehr, chairman, executive committee, Regional Conference of Nomenclature of Diseases, New York.
Miss Jessamine Whitney, statistician, National Tuberculosis Association, New York.

# Government Services

### Survey of Types of Cancer Treatment

The U. S. Public Health Service will undertake immediately a special study of the efficiency of various types of cancer treatment, it was announced October 3 at a meeting of the National Advisory Cancer Council. The council approved regulations drawn up by the National Cancer Institute for the loan of its grams of radium to various hospitals and clinics which are in need of radium for cancer treatment and for the skilled physicians and special equipment essential for its proper use. A feature of the meeting was the ground-breaking ceremonies for the new cancer institute on a fifteen acre site in Bethesda, Md. Mrs. Luke I. Wilson, who donated the tract, participated in the ceremonies. The $600,000 building is expected to be ready for occupancy July 1, 1939. The next meeting of the council will be held Jan. 3, 1939, at which time it is expected several grants-in-aid to hospitals and research institutions will be awarded.

### New Appointments in Public Health Service

The following have been commissioned as assistant surgeons in the regular corps of the U. S. Public Health Service:

Harold Martin Graning, Los Angeles
Vernon Terrell Davis Jr., Denver
Karl Habel, Philadelphia
Francis Theodore Zinn, Fort Worth, Texas
Ralph Erhart Wenzel, Mobile, Ala.
Robert Telford Hewitt, New York.
Lawrence William Brown, San Francisco
Harold Tycho Castberg, Wenatchee, Wash.
Robert Roland Smith, Baltimore
Donald Roland Auten, Boston.
Murray Allen Diamond, Lexington, Ky.
Max Rudolph Kiesselbach, Los Angeles
James Allen Grider Jr., Angel Island, Calif.
Lamar Blewett Harper, Washington, D. C.
Franklin Lewis Price, Detroit
Weldon Algernon Williamson, Galveston, Texas
Robert Dean Wright, Washington, D. C.
Aaron William Christensen, Miami, Fla.
Carl Vincent Morrison, Springfield, Mo.

The following have been commissioned as assistant surgeons in the reserve corps for active duty at the places indicated:

Dr. Nobel W. Guthrie, U. S. Quarantine Station, Miami.
Dr. Robert McCune Jr., U. S. Public Health Service Dispensary, Washington, D. C.
Dr. Joseph H. Goldberger, U. S. Southwestern Reformatory, El Reno, Okla.

# Foreign Letters

## LONDON

*(From Our Regular Correspondent)*

Oct. 1, 1938.

### Preparation for the Casualties of Air Raids

London has been described as "a province covered with houses." It contains over 8,000,000 persons. It was bombed on a small scale in the great war, and the danger of an attack on a larger scale has been foreseen and precautions have been taken. But no such gigantic problem, arising from the latest development of "civilized warfare," has been faced before. Air raid precautions, such as the manufacture by the government of gas masks for the whole population of the country, have been organized for some time. When the international tension became acute during the past week trenches were dug in the London parks and other open spaces, sections of the tube railways were closed to traffic so that they could be used as places of refuge and important buildings were sandbagged. Extensive plans for the evacuation of London were to be brought into operation on September 30 if the international tension was not relieved. Between 10 a. m. and 5 p. m., 500,000 school children and 2,000,000 other persons were to have been removed to a zone from 25 to 50 miles from London, in which billets and food supplies had been arranged. Never before in the world have mass movements been organized on such a scale. The evacuation was to be voluntary, but the billeting, for which preliminary surveys had been made, was to be compulsory. The evacuated persons would be given free railway tickets, but they would have no choice as to their destination. They were to take their gas masks with them. Nothing seems to have been neglected. Special precautions were even taken at the Zoological Gardens with regard to the animals. Basements in various parts of the gardens were strengthened with sandbags and equipped as air raid shelters. Supplies of sand were available at various points in case of fire. All poisonous snakes and spiders were to be killed immediately. Material was at hand for the immediate repair of cages, and should any large animals escape they were to be shot. The conversion of the motor coaches used for passenger traffic into ambulances, fitted with stretchers for the conveyance of the wounded, was arranged.

#### HOSPITAL ARRANGEMENTS

The arrangements for dealing with casualties were elaborate. Dressing stations for first aid were established all over London, for which lists of physicians were prepared. Physicians were to attend in shifts of eight hours so that two would always be on duty. At the hospitals, operating teams were organized and extra operating rooms fitted up. How complete the arrangements were may be shown by taking one hospital as an example, University College Hospital. Every one on the staff—physicians, surgeons and porters—and all the students were allotted duties. Twenty operating teams were organized, who were always to be on duty, day and night, in shifts of two. The hospital would thus be able to deal with 1,000 casualties from an air raid. The operating rooms were rendered gas proof. A complete transfusion service was organized. The admission of casualties to three destinations was arranged in every detail. There was to be a patrol of hospital porters, and crush barriers and a complete decontamination center were to be set up. Squads of students were on duty day and night making splints. A billeting officer was appointed who was to arrange for the housing of those on duty. There was a canteen staff for the feeding of everybody. Students were also appointed as stretcher bearers. The internal telephone of the hospital was rendered bomb proof. A well known dermatologist was given the charge of all cases of burns. A special pathologic service was arranged. Even concert parties for the entertainment of both workers and patients were organized. The hospital records were stored in bomb-proof and gas-proof shelters.

These arrangements for dealing with 1,000 casualties from one air raid at one hospital show the numbers which were expected in London. That number could reasonably be multiplied by twenty for the whole metropolis. It was anticipated that 150 tons of high explosive might be rained down in one raid. Effectual precautions had been taken against gas and fire bombs, but against high explosives good protection could be afforded only by underground shelters, provision of which in any adequate number would have to be a matter of years. The official forecast was that air attacks on London would be severe for about a month and then rapidly fall off, as the antiaircraft measures had been so perfected that the losses of the attacking force would be formidable and their numbers could not be kept up. Of course a good many civilians left London when the crisis became acute, but not sufficient to cause any apparent loss of numbers. The calmness with which the population faced the danger was remarkable. In most cases no difference of demeanor was evident after the danger was lifted.

### A Modification of the Thomas Splint

It has been said of Thomas's splint that it is so perfect that all attempts to improve it have only had the opposite effect. Although it may not be possible to improve the splint as an appliance, modifications for the purpose of carriage or storage —problems which Thomas had never to face—may be possible. These problems have minimized its usefulness in the army, as has also the need of stocking various sizes. Mr. A. G. Ord has overcome the last-named disadvantage by an adjustable Thomas splint with an expandable ring. This when fully open will fit the largest thigh and when closed can readily be used as an arm splint. Bearing in mind these advantages, the medical directorate of the Indian army looked out for a more portable splint for frontier warfare than the standard Thomas splint. They found that Lieut.-Col. H. Horan Brown of the Indian medical service had devised a modification of Ord's splint which seemed to overcome all difficulties. Horan Brown has hinged the adjustable ring. On the outer surface he fitted a wing-nut, which firmly fixes or releases the hinge. The ring can be adjusted to any useful circumference and can be hinged to any comfortable shape to fit arm or leg. The splint can be packed when folded flat. This device means that in transport the Indian army is no longer compelled to tie its Thomas splint to a mule, camel or roof of an ambulance car but can pack a dozen or more in a fracture box. The design should prove of great value on account of economy in load and space for field medical units.

### The Darwin Family

The Darwin family is a remarkable example of hereditary ability. The grandfather of Charles Darwin, Erasmus Darwin, was an early evolutionist, botanist and poet. Four of the five sons of Charles Darwin attained eminence as scientists. Sir George Darwin was a distinguished astronomer; Sir Francis was a botanist; Sir Horace was an engineer who provided the apparatus for the natural science laboratories at Cambridge. The only surviving son, Major Leonard Darwin, who is now 87, is well known as a eugenist and economist. Dr. Charles Darwin, the son of Sir George and therefore the grandson of his great namesake, is professor of natural philosophy and Master of Christ's College, Cambridge. He is to preside next year over the Section of Mathematical and Physical Sciences of the British Association.

## PARIS

*(From Our Regular Correspondent)*

Sept. 24, 1938.

### Recovery from Streptococcic Empyema Following Chemotherapy

At the June 24 meeting of the Société médicale des hôpitaux of Paris, the twenty-first case of streptococcic empyema in France in which chemotherapy was employed was reported by Drs. Levy-Valensi, Sèze and Inbona. The patient was a woman, aged 59, with the typical physical signs of a large pleural effusion. Cultures made from the purulent fluid removed by aspiration revealed streptococci. The patient was given 2.25 Gm. daily of original prontosil. On the fifth day after the beginning of this treatment, 1,200 cc. of pus was aspirated, but only an occasional streptococcus was found in smears of the fluid. Five days later 700 cc. of pus was aspirated, but no streptococci could be found in the smears or cultures. The temperature dropped gradually, and x-ray examination of the chest three months after admission failed to show any fluid in the pleural cavity.

### Septicemia with Meningitis Treated with Sulfanilamide

Drs. May and Mozzconacci reported at the July 8 meeting of the Société médicale des hôpitaux of Paris the case of a woman, aged 24, who was admitted to the hospital May 16, 1938, with symptoms of meningitis, which had appeared on the fifth day after an induced abortion. She was in stupor, with a high temperature and marked rigidity of the neck. Lumbar puncture revealed a turbid fluid containing many leukocytes and, on culture, a large number of streptococci. The blood culture was negative. The patient was given daily doses varying from 4 to 6 Gm. of sulfanilamide by mouth and on four successive days 0.85 Gm. intraspinally. In addition she was given 80 cc. daily of the Vincent antistreptococcus serum. Rapid improvement followed, so that the meningeal symptoms disappeared within three days and the spinal fluid inoculated on culture mediums failed to show any growth. However, the high temperature persisted and the blood culture became positive for streptococci on the fourth day after admission. The clinical signs of septicemia did not lessen nor did the blood cultures become negative, in spite of large doses, from 9 to 12 Gm., of sulfanilamide. Death took place about four weeks after admission. The interesting features were the complete recession of the symptoms of meningitis, accompanied by sterility of the spinal fluid, and the persistence of the generalized streptococcic sepsis despite a total dose of 181 Gm. of sulfanilamide. The authors expressed the opinion that if, in a case of streptococcic septicemia, the blood cultures continue to be positive chemotherapy has been of no avail and the prognosis is unfavorable. This patient had only slight cyanosis even when large doses of sulfanilamide were given.

### Renal Nanism in a Rachitic Baby

The clinical pictures of renal nanism and of rachitis are familiar to pediatricians. De Toni in 1933 appears to have been the first to call attention to a third syndrome, in which, in addition to a combination of the symptoms and objective manifestations of renal nanism and of rachitis, there are disturbances of metabolism, especially of the glucides. De Toni considered this third syndrome the result of the coexistence of renal rachitis and renal diabetes with acidosis, the two dependent on the same cause. Since 1933 similar cases have been reported by other pediatricians. At the July 8 meeting of the Société médicale des hôpitaux of Paris, a typical case of the De Toni syndrome was reported by Dr. Marcel Lelong. An apparently normal female infant began at the age of 4½ months to have a loss of appetite and to show a cessation of growth. These manifestations were accompanied by evidences of rachitis along the junction of the ribs and costal cartilages as well as by a temperature which went to 104 F. and a temperature curve showing marked oscillations. There was also an extreme degree of polydipsia. Careful search failed to reveal any connection between the persistently high temperature and a focus of infection or error in feeding. The signs of rachitis began, however, to be more marked during the following months, and these signs were accompanied by a noticeable retardation of growth and loss in weight. At the age of 11½ months, marked hepatomegalia was noted, as well as glycosuria, hyperglycemia after a tolerance test, hypercholesteremia, hyperlipemia, albuminuria with acidosis and a high blood urea content. These clinical and laboratory manifestations were accompanied by intense polydipsia. It is difficult to explain the persistent high temperature. The hepatomegalia and evidences of disturbances of metabolism were described as a "polycoric hepatomegaly syndrome" by Debré in 1931. The case reported by Dr. Lelong is the first in which the patient could be followed from the very onset of the De Toni syndrome. The x-ray appearances did not differ in any respect from those of typical rachitis.

### Death of Professor Crouzon

The death of one of the leading neurologists of France, Prof. O. Crouzon, has been announced. After many years of effort he succeeded in convincing the other members of the faculty of the Paris Medical School that the field of social medicine had developed so rapidly that the subject should be included in the curriculum. Professor Crouzon was the first occupant of the newly created chair and began his course in the fall of 1937, aiming to include instruction on all types of social laws, many of which are in force here today. He was a commander of the Legion of Honor, attending physician at the Salpêtrière, the large Parisian hospital for neurologic disorders, and director of the school for nurses of the Paris public hospitals. A pupil of Dieulafoy, Babinski and Pierre Marie, Professor Crouzon was known all over the world through his contributions to neurology, especially on epilepsy, chorea and multiple sclerosis.

## BERLIN

*(From Our Regular Correspondent)*

Sept. 10, 1938.

### Biochemical Cancer Problems

Von Euler, professor of physiologic chemistry at Stockholm, recently lectured on biochemical cancer problems before the Berlin Medical Society. In present day oncologic research the metabolism of cancer cells occupies the foreground of interest. The author pointed out, among other things, that arginase is present in large quantities in cancers, that the increased nuclein metabolism leads to an increase in the peptidase value and that certain enzymatic changes appear in all the tissues as well as in the blood of patients with carcinoma. The author made particular reference also to the present status of the theory of carbohydrate decomposition, especially as to the effective mechanism of the enzyme system, set in action thereby. He reported the investigations carried on at his institute; these have led to the discovery of a new enzyme, diaphorase, which represents an important link in the chain of the dehydration agent. In tumors an obvious displacement of the enzyme content is observable. For example, in sarcomas the ratio of dehydro-co-zymase to co-zymase is 6:10, as against 8:10 in the muscle. The cytochromite value is also lowered in sarcomas. Aerobic glycolysis of tumors, discovered by Warburg, according to the author is conditioned by a deficiency in the cytochrome system. The factors which can lead to the transformation of a normal cell to a cancer cell are manifold: predisposition, tarry substances, cancerigenic rays and so on. The problem of virus constitutes a special topic in itself.

According to the author, the virus of mosaic disease of the tobacco plant, which, as is known, can be isolated in crystalline form, obviously represents an enzyme complex. However, the problem of virus in human cancer remains unsolved. Cancer cells have frequently been said to originate in a mutation of normal cells. The author regards the cancer cell as a "cytochromase-deficient mutant," analogous to the well known mutation observed in plants; for example, the "chlorophyll-deficient barley mutants" produced by the irradiation of barley seed. Herein the author envisages a possible explanation of the modus operandi of cancerigenic rays.

### The Roentgen Therapy of Myomas

The well known gynecologist and roentgen therapeutist Professor Gauss of Würzburg recently had published in *Strahlentherapie* a discussion of whether or not the almost complete rejection of surgical treatment, as practiced by him, in cases of myoma and preclimacteric metropathies, has been justified. Gauss employed irradiation in 955 (91.1 per cent) of 1,048 cases of these two conditions. On the basis of his experience he was able to formulate and verify the following guiding principles: 1. Radical treatment of myomas and preclimacteric metropathies is first indicated if the pathologic manifestations demand more than medication, baths and minor gynecologic therapeutics. 2. With preclimacteric metropathies it is only a question of irradiation. 3. Myomectomy is indicated only in certain infrequent circumstances: namely, if the tumor is of a pedunculated submucous nature, is pedunculated with a tendency to torsion of the pedicle or is subserous and already twisted about the pedicle; if the operation seems necessary to the maintenance of menstruation and fertility; if putrefaction or suppuration of the tumor, which could lead to general sepsis, is present, and, finally, if it is uncertain whether the neoplasm is a myoma or an ovarian tumor.

### The German Roentgen Society

This year's congress of the German Roentgen Society, held at Munich, was considered the first Greater German convention of the society. The large number of Austrian delegates present participated as regular members.

The first theme for discussion was "Roentgenology and Public Health." A report was submitted by Dr. Blome of Berlin, a member of the staff of the national fuehrer of physicians. Notwithstanding the great difficulties entailed, an attempt must be made to encourage the utilization of roentgen procedures, even if on a small scale, by the general practitioner. With this in view, suitable miniature apparatus should be placed on the market. Present day conditions are certainly not propitious for a prompt realization of this aim, especially with regard to the roentgenologic training of the general practitioner. Dr. Blome perceives a need for separate departments of roentgenology, in which both medical students and graduate physicians may receive training. The study of roentgen procedures should be readily available; if this does not eventuate, instances of unskilful use of roentgen apparatus will continue to be encountered.

The second day's session was dedicated to therapeutics. It was marked by the reading of two papers on the treatment of cancer; Sauerbruch of Berlin discussed the problem as a surgeon, and Schinz of Zurich spoke as a roentgenologist. Both authors agreed that at present only two effective weapons against cancer are known: the knife and the ray. Among other things, Sauerbruch approved the exclusive use of roentgen therapy for tumors of the skin and of the accessible mucosa, even in cases of so-called "operable" cancer. Schinz described the cure in certain cases of cancer, including carcinoma of the vocal cords, by exclusive use of irradiation. On the basis of extensive verified statistics, Schinz attempted to prove the functional capability of irradiation in particular localizations of carcinoma. He then asked if surgery could provide a corresponding array of incontestable statistics. The possibilities of roentgen therapy in the fight against cancer ought to be as completely developed as those of surgery, and on a similar independent basis. Then no longer, as at present, would a majority of patients be first submitted to roentgen therapy only after the disease has reached an advanced stage and, as often happens, after the failure of surgical measures.

A large number of individual reports were read to the congress, only a few of which can be mentioned here. Worthy of note were the data contributed by Schittenhelm, Munich clinician, on the indications for irradiation in the treatment of exophthalmic goiter and angina pectoris. In substance these observations represented verification of work previously done by French roentgenologists. The results reported by Chaoul of Berlin from his close radiation treatment of rectal carcinoma constitute a landmark in the advance of roentgen therapy and the expansion of its sphere of indication. In fourteen of twenty-three cases complete disappearance of the tumor was obtained. These favorable results are all the more noteworthy since the cases in question were of the inoperable variety of cancer. In addition to the favorable percentage of primary remission of symptoms, two of Chaoul's cases represent cures of four years' standing, with complete restoration of working capacity. Dyes of Würzburg reported roentgenologic cure of sarcomas, with no recurrence after five years.

## ITALY

*(From Our Regular Correspondent)*

Sept. 15, 1938.

### Crusade Against Mosquitoes

The general department of public health in Italy recently sent a circular letter to the municipal heads of public health, stating that the crusade against anopheles which has been carried on in the malarial zones has been successful. However, Culex pipiens is abundant in warm rural districts and balnearies. It is bothersome, though harmless. A campaign against mosquitoes in rural districts is to be carried on. Small agricultural centers will be inspected in order to prevent the formation of ponds and to control the sanitary conditions of water pipes and sewers. Wells will have to be covered and provided with pumps; horse ponds and public lavatories will be cleaned at regular intervals. The use of paris green alone is not sufficient to destroy culex larvae in deposits of stagnant water which cannot be emptied. Oily liquids should be poured over the water and gambusia thrown in to spawn. For the actual destruction of mosquitoes, mechanical devices, pulverized liquid derivatives of petroleum and fumigation with pyrethric substances will be used. The campaign will be the most intense in nonmalarial zones and in climatic rest resorts.

### Society Reunions

The Associazione Medica of Trieste recently met to discuss chemotherapy in the treatment of gonorrhea. Professor Levi reviewed theories on the mechanism of chemotherapy and reported his experiences with sulfanilamide. Sulfanilamide (streptosil) was administered to fifty of a group of 100 patients. The gonococcus disappeared from the secretions in seventeen cases during the first week and within three weeks, that is, four or five weeks after onset of the disease, in nineteen. Gonorrhea was controlled within forty-five days in the fifty patients who were given two or three cycles and lavages of sulfanilamide. Professor Freund administered dimethyl-disulfanilamide (uliron) to thirty-two patients with gonorrhea. Recovery was obtained in twenty-three cases. By further observation, the persistence of recovery was verified in fourteen cases. Nine of the patients did not return for consultation after the symptoms of the disease had disappeared. The treatment failed in seven cases. Two patients are still being treated. There were no accidents.

Professors Ravalico and Gentili administered one of three different sulfanilamide derivatives to each subgroup of a group of fifty-six patients who had gonorrhea. The treatment induced recovery in thirty-four cases and failed in twenty-two. Professor Robba administered different sulfanilamide preparations to eighty-two patients with gonorrhea. Original prontosil (sulfamidochrysoidine) had a moderate antigonococcic action in eleven cases. The action of the drug was slower, less energetic and more toxic than that of some of the other preparations. The treatment is an adjuvant of the treatment in common use. Sulfanilamide was administered to forty-seven patients who had been suffering from gonorrhea for more than four weeks. It brought recovery in twenty-three cases within from eight to twenty days. Fifteen per cent of the patients, in whom the disease was of short duration, recovered. As a rule the patients received also local lavages with weak solutions of potassium permanganate. Sulfanilamide has an energetic antigonococcic action. As a result of his experience, the speaker is against prolonged administration of any sulfanilamide derivative and also against the use of the drug in the treatment of gonorrhea of short duration, as the drug may increase the resistance of the gonococcus. The speaker saw slight toxic effects in seven patients of a group of eighty-two who received the treatment.

## AUSTRALIA

*(From Our Regular Correspondent)*

Aug. 17, 1938.

### National Insurance in Australia

National insurance is now on the statute books in Australia in spite of the widespread opposition of the members of the medical profession. A royal commission, however, will report on the payment for and conditions of medical service and endeavor to make a recommendation which will be acceptable to those concerned. The members of the medical profession are not satisfied with the yearly fee of 11 shillings for the service expected of them, but the situation has been somewhat eased by the issue by Mr. J. B. Brigden, commissioner of the National Health Insurance Commission, of a list of services which will be excluded from the scope of the National Health Insurance Act:

Care at confinement.

Service involving workers' compensation liability and similar insurance, for example the treatment of injuries incurred in motor accidents when claims for the cost of medical treatment can be discharged by compulsory third party motor insurance.

Administration of anesthetics necessitating the presence of a second practitioner.

Treatment of venereal diseases aside from advice as to the necessity of treatment and the infectivity of the condition.

X-ray investigation and treatment and radium treatment.

Pathologic investigations.

Massage.

Electrical diagnosis and treatment.

Consultations after full clinical investigation and adequate preliminary treatment.

Amputations.

Treatment of complicated fractures (such as a fracture penetrating a lung, a fractured pelvis penetrating the bladder or a fracture causing lesions of nerves and large blood vessels), compound fractures of the larger bones (excluding phalanges), fractures necessitating the skilled attention of an orthopedic surgeon (such as fractures of the femur), fractures necessitating an operation (including ununited fractures), fracture dislocations of the larger joints (excluding phalangeal joints) and dislocations of the spine or hip or any dislocation usually necessitating the skilled attention of an orthopedic surgeon.

Operations (1) involving the opening of a closed body cavity, such as the meninges, pleura, peritoneum or joint cavities; (2) involving organs not included in the preceding list, such as the uterus, kidney, ureter, bladder, urethra, eye and thyroid and (3) usually requiring the attendance of a specialist (including, for example, mastoid operations, dissection of the tonsils or nasal septum, sinus operations and operations for the treatment of malignant disease).

Treatment usually requiring the attendance of a specialist; for example, ophthalmologic treatment not ordinarily performed by general practitioners, treatment of special cutaneous diseases requiring the attendance of a dermatologist, specialized treatments of the more serious diseases of the bones and joints (such as tuberculosis requiring surgical treatment, osteomyelitis and suppurative arthritis) and specialist treatment necessitating the services of a neurologist or psychiatrist.

### Medical Education

The high standards of medical education in Australia are generally recognized. In order to maintain these standards and to enable the medical profession to give efficient and faithful service, teaching needs should continually be under revision. Recent events in Melbourne, however, show that the university, through failure of public support, has not been able to fulfil its medical obligations. The recent occupant of the chair of anatomy (Prof. F. Wood-Jones), for lack of secretarial assistance, not only had been obliged to forego research but could not make that individual contact with his students which he regarded as one of the first obligations of a university teacher. While the various governments of Australia have poured students into the universities, they have shown either a complete disregard for or a lamentable ignorance of teaching requirements. The administrative authorities of the University of Sydney are confronted with the almost impossible task of providing for the training of physicians for the needs of the state with a laboratory accommodation and staff hardly sufficient for the needs of one-fifth the number of students who are entering the courses. There are nearly 300 students in the first year of medicine, and several of the other years are overcrowded. There is little possibility of making the personal contacts essential in medical education. Australian medical education is confronted with two kinds of disability: overcrowding of schools and inadequate staffing on the one hand, and scientific isolation of the individual schools on the other. Isolation from the scientific world and the distance of the universities from one another are serious handicaps to the spirit of cooperation found in smaller or more populated countries. Seldom, if ever, does the teaching staff of one Australian medical school come into such contact with the staff of another that its members know and appreciate the attainments and the work of their confrères from another state.

### The Nutrition of the Australian People

Although there exist in Australia no gross food deficiencies such as are witnessed in the large industrial areas of America and England, recent investigations undertaken by the Commonwealth Advisory Council on Nutrition have provided widespread evidence of mild ill health produced by malnutrition. This council was appointed by the commonwealth government in 1936 after the League of Nations decision to investigate world-wide problems of nutrition. The final report of the council has been made available, and, although the results of the inquiry are not conclusive, they are very suggestive. The report shows that there is much ignorance in the community of the proper balance of food items and that some people in both town and country are unable to obtain the essential fresh foods. For these reasons a considerable mass of minor departures from normal health exist among children; up to 33 per cent of children examined were reported in an unsatisfactory condition. The evidence points to faulty selection of diets as the main cause of malnutrition, a selection sometimes necessitated by poverty but more often the result of ignorance. The ill health found is of two principal kinds: alterations in the growing bones resulting from lack of essential food elements, such as those contained in milk, fruit and vegetables, and alterations in the chemical balance of the body due to excessive intake of refined carbohydrates. Research proceeded along two main lines. First, an attempt was made to determine the nature and the quantity of food consumed by individuals, and, second, a clinical survey of children was conducted to determine their physical condition.

### SURVEY OF HOUSEHOLD DIETARIES

The collection of data on diets presented some difficulty. An appeal through the press for cooperation by the public brought a poor response, and a system was finally instituted whereby housewives, reached mainly through baby health centers, recorded in a special book the details of all the food purchased for their families over a period of at least one month. The data thus received from 1,789 families can scarcely be considered a faithful representation of conditions actually obtaining in the community. The council admits that the data will show a position rather more fortunate than actually exists. Each of the 1,172 food items listed in the booklets was analyzed for its carbohydrate, fat, protein, moisture and ash content. Statistical analysis of the material showed that the weekly expenditure on food in the three eastern capitals varied between 11s. 6d. and 13 shillings for each adult male, while in Adelaide the figure was 10s. 2d. This discrepancy is due to the low utilization of milk and butter in Adelaide as well as to the home growing of fruit. Each adult male used 34 pounds of food a week, with a wastage allowance estimated at between 5 and 10 per cent. The caloric value of this average amount is more than sufficient to meet requirements. On a fuel basis alone however, although the average was high, 6 per cent of the diets studied were subliminal.

The consumption of protective foods fell far below an optimum allowance. Over 25 per cent of the dietaries studied showed inadequate consumption of milk, and 25 per cent failed to show a desirable consumption of eggs. The consumption of potatoes was below what is considered optimal. As to fresh fruit, 6 per cent of the adult males consumed half a pound a week and 12 per cent 1 pound a week. There was no evidence of an inadequate consumption of butter. No attempt was made to survey the vitamin content of the foods used.

### CLINICAL EXAMINATION OF CHILDREN

The second portion of the investigation took the form of an extensive survey, conducted by Dr. F. W. Clements, of conditions in the far inland areas of Australia. Dr. Clements was equipped with an automobile unit consisting of motor caravan with sleeping quarters, small laboratory and portable x-ray unit. A physical examination determined whether the state of nutritional development of the child was "satisfactory" or "unsatisfactory." In addition, x-ray examinations of the epiphyses of the wrist, with blood and visual adaptation tests, were used to select the actual cases of malnourishment and to detect the actual effects of the malnutrition.

### ECONOMIC FACTORS

A third section of the report gives consideration to economic and other factors involved in the consumption of protective foods. There is no shortage in the production of these foods in Australia, and the inquiry has clearly demonstrated that there is room for expansion of home markets. The council emphasizes the need for efficient distribution and proper storage of perishable foods in country districts.

### RECOMMENDATIONS

In conclusion the council recommends as a guide for future action that the whole system of health supervision of children be immediately reviewed with the object of securing regular and complete supervision of bodily health during infancy and childhood to the age of 16 years and that regular instruction of all children in the elementary principles of hygiene and physical culture and of all girls in the composition and preparation of food be instituted. It is also recommended that a central coordinated committee be appointed to foster the general health of the rising generation, the correction of faulty diets in a general sense by the publication of dietary advice and the investigation and rectification of specialised local defects both physical and nutritional. It has been suggested that a subcommittee of the National Health and Medical Research Council be formed to continue the function of the present Advisory Council on Nutrition, whose terms of reference have now been satisfied.

### Cancer Investigation

Extensive plans have been made in Western Australia for a thorough investigation of a cancer treatment by the use of unorthodox biochemical therapies. The investigating committee has been appointed by the West Australian branch of the British Medical Association, and all expenses incurred will be borne by the state government. Dr. Koch, the discoverer of the treatment, which is asserted to have effected many cures in the United States, will probably be brought to Australia. In Australia little is known of Dr. Koch's work.

## Marriages

ANDREW MATHEWS MCLAUGHLIN, Waynesboro, Va., to Miss Betty Watkins Martin of Catawba Sanatorium, August 27.

ALLEN LEDYARD DE CAMP, Fayetteville, N. C., to Miss Katherine Besbord Bingham of Rydal, Pa., September 8.

LEONARD R. BOLOGNINO, Kew Gardens, N. Y., to Dr. CHRISTINE R. HEPPERMAN of Amsterdam, September 17.

EDWIN MACRAE RUCKER, Durham, N. C., to Miss Nancy Connelly Johnston of Nicholasville, Ky., July 9.

WILLIAM CHILDS CANTEY, Philadelphia, to Miss Blanche Moorer Dennis of Darlington, S. C., August 27.

ANDREW JOHN VALCOS KLEIN, East Orange, N. J., to Miss Louise W. Ripley at Point Pleasant, August 27.

CLARENCE C. CHEWNING JR., Bowling Green, Va., to Miss Alice Louise Thompson of Richmond, July 26.

ALLEN ARTHUR LILIENTHAL, Sanatorium, Miss., to Miss Jane Drexler Roth of Memphis, Tenn., September 4.

ROBERT S. ROSNER, Cleveland, to Miss Evelyn D. Harris of Monahans, Texas, at Cincinnati, September 4.

WILLIAM ROBERTS SANDUSKY, New York, to Miss Kate Wakeman Street of White Plains, July 4.

HENRY E. PALMER, Tallahassee, Fla., to Mrs. Leah Burgess Furlong of Rochester, N. Y., August 9.

IRWIN H. ZIELKE, Traverse City, Mich., to Miss Marie Elizabeth Cutler of Pittsburgh, July 28.

BERNARD S. STELMASZYK, LeRoy, N. Y., to Miss Irene P. Skarupinski of Buffalo, September 22.

HUGH GAMBEL CLARK, Fairfield, Ala., to Miss Buena Vista Gilchrist of Birmingham, August 16.

ROWLAND FRANKLIN ZEIGLER JR. to Miss Dicksie C. Barfield, both of Florence, S. C., August 3.

WALTER GLENN HARDY, Roanoke, Va., to Miss Ethel D. Killinger of Rural Retreat, July 2.

ROBERT CLARK LAUGHLIN, Baltimore, to Miss Mary Alston Cowan of Blacksburg, Va., July 2.

LOUIS J. ZINTERHOFER, Detroit, to Dr. MARTHA ERWIN MADSEN of Houston, Texas, July 23.

JOHN KIRK RICHARDSON to Miss Louis Clyde Woody, both of Richmond, Va., June 24.

CULLEN WARD IRISH to Miss Lois Patricia Heberling, both of Los Angeles, June 2.

ROBERT R. RUDOLPH to Miss Rachel M. Moore, both of Columbus, Ohio, July 2.

HENRY M. KARLAN, New York, to Miss Alexandria Stambler of Brooklyn, June 26.

VON A. LONG, Hartsville, S. C., to Miss Sara Elizabeth Ruff of Newberry, July 8.

LEWIS BETTY STATON to Miss Jeanette Bryce, both of Richmond, August 2.

JOHN H. LESHER to Miss Hilda Agee, both of Knoxville, Tenn., June 8.

HENRY M. LAMB, Portland, Maine, to Miss Helen B. Lord, August 24.

WILLIAM RICHARD MCATEE, Erie, Pa., to Miss Sally Organ, August 24.

## Deaths

**Alexander Mason Evans,** Baltimore; College of Physicians and Surgeons, Baltimore, 1912; associate professor of surgery at the University of Maryland School of Medicine; fellow of the American College of Surgeons and member of the Medical and Chirurgical Faculty of Maryland; served during the World War; aged 53; on the staff of the Mercy Hospital, where he died, July 24, of cardiovascular disease.

**Harry Simpson Davidson,** Akron, Ohio; Ohio Medical University, Columbus, 1897; member of the Ohio State Medical Association; past president and vice president of the Summit County Medical Society; at one time member of the board of education of Barberton; formerly member of the state legislature and county coroner; served during the World War; aged 67; died, August 1.

**Charles Lebram Vaux,** Newark, N. Y.; University of Buffalo School of Medicine, 1902; member of the Medical Society of the State of New York and the American Psychiatric Association; served during the World War; aged 57; medical superintendent of the Newark State School, where he died in July of a skull fracture received in a fall down stairs.

**Grace Elizabeth White,** Ardmore, Pa.; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1894; for many years physician in charge and owner of the Wood Lea Sanitarium; aged 69; died, July 5, in the Graduate Hospital of the University of Pennsylvania, Philadelphia, of carcinoma of the sigmoid and diabetes mellitus.

**Haskell Talamo** ● Worcester, Mass.; Harvard University Medical School, Boston, 1926; member of the American Academy of Pediatrics and the New England Pediatric Society; on the staffs of the Memorial and Fairlawn hospitals, Worcester, and the Children's Hospital, Boston; aged 42; died, July 10, of subacute bacterial endocarditis and coronary embolism.

**Clifton Rogers Dudley,** St. Louis; Bellevue Hospital Medical College, New York, 1891; served during the World War; formerly medical director of the Missouri State Life Insurance Company and the Continental Life Insurance Company; aged 70; died, August 25, in the Veterans Administration Facility, Jefferson Barracks, of heart disease.

**Harry Sebastian Reger** ● Jamestown, N. Y.; George Washington University School of Medicine, Washington, D. C., 1904; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; surgeon to the Jamestown Hospital; aged 60; was found dead, July 14, of coronary thrombosis.

**John Vosbergh Stevens** ● Janesville, Wis.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1885; at various times professor of pediatrics at his alma mater; an Affiliate Fellow of the American Medical Association; formerly member of the state board of medical examiners; aged 86; died, July 23, of pneumonia.

**Amos Vastine Persing** ● Watsontown, Pa.; Jefferson Medical College of Philadelphia, 1893; member of the board of health, and health officer for many years; at one time member of the board of education and bank president of Allenwood; aged 69; died, July 22, in Allenwood, of diabetes mellitus and pulmonary tuberculosis.

**Frederick Berkley Bond,** Southport, N. C.; University of Buffalo School of Medicine, 1906; member of the Medical Society of the State of North Carolina; served during the World War; aged 57; died, August 1, in the James Walker Memorial Hospital, Wilmington, of injuries received in an automobile accident.

**John William Smith,** Bronxville, N. Y.; University of the City of New York Medical Department, 1889; past president of the Westchester County Medical Society; at one time district health officer; aged 74; formerly on the staff of the Lawrence Hospital, where he died, July 2, of Parkinson's disease.

**William Watson Wymore,** San Francisco; Cooper Medical College, San Francisco, 1895; at one time served as police surgeon; on the staff of St. Francis Hospital; for many years member of the board of health; aged 72; died, July 29, of coronary occlusion and cirrhosis of the liver.

**Anna Mabel Skinner,** Watertown, Mass.; Boston University School of Medicine, 1903; member of the American Orthopsychiatric Association; associated with the Judge Baker Child Guidance Foundation; aged 71; died, July 24, of chronic nephritis, myocarditis and bronchopneumonia.

**Henry Morris Spofford** ● Batavia, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1902; veteran of the Spanish-American and World wars; formerly health officer; on the staff of St. Jerome's Hospital; aged 64; died, July 9, of heart disease.

**James Glass,** Framingham, Mass.; Harvard University Medical School, Boston, 1904; member of the Massachusetts Medical Society; served during the World War; formerly on the staff of Framingham Union Hospital; aged 67; died, July 4, of chronic myocarditis.

**Emmott Howd** ● Troy, N. Y.; Albany (N. Y.) Medical College, 1898; fellow of American College of Surgeons; surgeon to the Leonard and Samaritan hospitals and obstetrician to St. Joseph Maternity Hospital; aged 66; died, July 9, of carcinoma of the stomach.

**Harry Sydenham Van Etten,** Stroudsburg, Pa.; Medico-Chirurgical College of Philadelphia, 1909; served during the World War; for many years secretary of the board of health; aged 55; died, July 14, in a local hospital following an operation for appendicitis.

**Rose Harrison,** Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1907; member of the Medical Society of the State of Pennsylvania; aged 54; died, July 20, in St. Agnes Hospital of perinephritic and nephritic abscesses.

**Wilson S. Erdman,** Quakertown, Pa.; Medico-Chirurgical College of Philadelphia, 1892; member of the Medical Society of the State of Pennsylvania; on the staff of the Quakertown Hospital; aged 70; died, July 17, of cirrhosis of the liver.

**Martin Molony,** San Francisco; National University of Ireland, 1888; member of the American Urological Association; fellow of the American College of Surgeons; aged 75; died, July 3, of chronic myocarditis and prostatitis.

**Edward M. Scherer,** Penn Yan, N. Y.; Bellevue Hospital Medical College, New York, 1893; member of the Medical Society of the State of New York; aged 68; died, July 19, in Rochester of arteriosclerosis.

**Clifton A. Northrop,** Hermon, N. Y.; College of Physicians and Surgeons, Baltimore, 1882; formerly health officer, and member of the school board; aged 82; died, July 12, of cerebral hemorrhage.

**William Norwood Rogers** ● Trenton, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1898; served during the Spanish-American and World wars; aged 66; died, July 27.

**Samuel Amos Stevens,** Monroe, N. C.; University of Maryland School of Medicine, Baltimore, 1900; aged 67; died, July 9, in a hospital at Charlotte, of uremia and arteriosclerosis.

**George Davis Farwell,** Elmhurst, N. Y.; University of the City of New York Medical Department, 1888; aged 80; died, July 2, in the Pilgrim State Hospital, Brentwood.

**Daniel Longaker** ● Reading, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1891; aged 68; died, July 22, in the Pennsylvania Hospital, Philadelphia.

**Caroline Lee Danford Carson,** Palo Alto, Calif.; Ohio Medical University, Columbus, 1898; veteran of the Spanish-American War; aged 68; died, July 4, of heart disease.

**George Morley Muttart,** Boston; University of Pennsylvania Department of Medicine, Philadelphia, 1890; aged 73; died in July of nephritis.

**Leo Taliaferro,** Madison Mills, Va.; University of Maryland School of Medicine, Baltimore, 1893; aged 72; died, July 19, of pneumonia.

**Henry Griffen Salter,** Cascade, Wis.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1909; aged 56; died, July 11, of embolism.

**Daniel J. Smith Jr.,** Elizabethton, Tenn.; University of Tennessee Medical Department, Nashville, 1894; aged 67; died, July 1, in Baltimore.

**Lawrence Phillip Adamson,** Girard, Kan.; University Medical College of Kansas City, 1894; aged 79; died, July 3, in Mount Shasta.

**Charles Asa Hoag,** Chicago; Chicago Homeopathic Medical College, 1891; aged 71; died, July 17, of organic heart disease.

**Ellis Andrew Smith,** Sunbury, Pa.; Baltimore Medical College, 1891; aged 70; died in July of uremia and nephritis.

**William H. Keen,** Nanton, Alta., Canada; Western University Faculty of Medicine, London, Ont., 1904; died, July 31.

**Ralph Leonard,** Berkeley, Calif.; Rush Medical College, Chicago, 1882; aged 86; died, July 29.

68

# Correspondence

## EVALUATION OF DRUGS USED AS DIAGNOSTIC AIDS

*To the Editor:*—In the interests of accuracy it should be pointed out that the recent review by Mettier and Leake on "Evaluation of Drugs Commonly Employed as Diagnostic Aids in Clinical Medicine" (THE JOURNAL, September 10, p. 986) contains statements which should be corrected in accordance with current technic. The most satisfactory compound for the rose bengal test of liver function is di-sodium-tetra-iodo-tetra-chlor-fluorescein and should be especially prepared for intravenous use. This is in accordance with the extensive experience of W. P. Stowe, G. D. Delprat and Alanson Weeks (*J. Lab. & Clin. Med.* **16**:923 [June] 1931; and *J. Clin. Path.* **3**:55 [Jan.] 1933; *J. Lab. & Clin. Med.* **20**:1297 [Sept.] 1935). With regard to roentgenology of the urinary tract, a full historical survey appears in *Urological Roentgenology* by M. B. Wesson and H. E. Ruggles, Philadelphia, 1936.

C. D. LEAKE, PH.D., San Francisco.
Department of Pharmacology,
University of California.

## THE SMALLEST BABY TO SURVIVE

*To the Editor:*—Some time ago Mrs. Grace Thomas of Le Sueur, Minn., read a statement that the smallest baby on record to live and develop normally weighed 1 pound 5 ounces (595 Gm.), which reminded her of the fact that she had a daughter who weighed only 20 ounces (567 Gm.) at birth. She asked me to forward her affidavit.

STATE OF MINNESOTA } ss.
COUNTY OF LE SUEUR }

Bridget Shea, being first duly sworn on oath deposes and says that she is over 65 years of age and that she lives at 402 North Second Street in the City of Le Sueur, Minnesota, and that she has lived at 402 North Second Street in the City of Le Sueur for over twenty years. Affiant states that Ruth Thomas of 316 North Second Street in the City of Le Sueur was born on February 24, 1926. Affiant was present at the birth of Ruth Thomas and she acted as mid-wife and helped Mrs. Grace Thomas, the mother of Ruth Thomas, bring Ruth Thomas into the world. Affiant states that Ruth Thomas was born at 7:30 A. M. Feb. 24, 1926, that affiant weighed the said Ruth Thomas the next day after her birth and that she weighed only twenty (20) ounces at that time. Affiant still has the scales on which affiant weighed the said Ruth Thomas, she still has possession of the scales and they are in working order, that the said Ruth Thomas was so small in size that she could almost lie in the ordinary retail cigar box, her fingers were not bigger than darning needles and her legs were no bigger than a lady's second finger. That Dr. Le Clere was her mother's doctor at the birth of said Ruth Thomas, and Dr. Le Clere at her birth said she would not live, she was so small. Doctor Le Clere is dead and all the records are lost or destroyed. Said Ruth Thomas was so small in size that she attracted the attention of one thousand (1000) people who came to see her during the first few months after she was born. She was so small in size that she could not be dressed for two months after her birth, and that during first two months after her birth she could only be bathed with olive oil with the use of small applicators. Further affiant saith not except that she makes this affidavit for the purpose of stating and affirming that said Ruth Thomas weighed only twenty (20) ounces at birth.

Witnesses: BRIDGET SHEA.
GERTRUDE OCHS.
FRED A. McGUIRE

Subscribed and sworn to before me this 24th day of August 1938.
W. E. OCHS, Notary Public, Le Sueur County, Minn.
My Commission Expires April 8, 1944.

It is unfortunate that she waited so long to report this case, as in the meantime the attending doctor has died and all his records are destroyed. As I started practicing here in this town in 1922 I knew that the facts were reasonably accurate; but to verify the accuracy of the weight as closely as can be done at the present time, I interviewed the midwife, Mrs. Shea, now 82. Mrs. Shea is still alert mentally and active; when asked how she could recall the weight of the baby she said "I put the baby in a blanket and in a pan and put all on the scale, and it showed 2 pounds. Then I took the baby out and I weighed the pan and the blanket and that was three-quarters pound, which left the baby's weight a pound and a quarter or 20 ounces." On being asked if she considered the scale accurate, she said she still had the same scale and brought it up. Checking with known weights showed it to be still accurate.

The mother brought in a small baby shoe, probably a doll shoe. I made an outline of the sole of that shoe on the back of the affidavit with the statement that the shoe was worn at 3 months of age. The mother also brought in a cigar box into which her husband tried to put the baby, stating that the legs had to be bent somewhat for the baby to lie in the box. Neighbors stated that at several different times they saw her in a shoe box.

Questioning both the mother and the midwife brought out that the labor apparently was extremely easy. There was practically no pain. The membranes ruptured while the mother was still up and around getting breakfast ready. The delivery took place within five or ten minutes thereafter, and the baby cried lustily at once and had a nice pink color. When the baby was 2 or 3 weeks old, some time in March, it had cyanosis and was revived by Mrs. Shea and developed normally without further mishaps.

At present Ruth Thomas is a very bright, intelligent, active girl, finished high school last spring and is entering college this fall.

SWAN ERICSON, M.D., Le Sueur, Minn.

# Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

## ACQUIRED OR CONGENITAL NEUROSYPHILIS

*To the Editor:*—A white man aged 29 complains of nervousness, loss of weight, a feeling of lassitude and insomnia of several months' duration. He is a clerk in one of the WPA divisions, is married and has two children aged 11 and 6 years, apparently in good health and normally developed. He had never undergone a physical examination. Physical examination revealed a typical Argyll Robertson pupil and absolute absence of the knee reflexes. The Romberg and coordination tests were negative. The blood examinations were Kolmer-Wassermann 4 plus, Kline 4 plus, Kahn 3 plus. The spinal fluid examination was Kolmer-Wassermann 4 plus, colloidal gold 1234432221000, globulin no increase, cell count 65 cells per cubic millimeter. His history is entirely negative as regards a primary lesion or secondary manifestations. However, since this condition has been uncovered his mother states that years ago she and his father had syphilis, for which they had some treatment, probably not much. Is it possible that I am dealing with neurosyphilis of congenital origin? If so, what is the prognosis? What would be the best course of treatment to pursue in this case? M.D., West Virginia.

ANSWER.—The Argyll Robertson pupil and absent knee jerks (are the ankle jerks also absent and are there other signs of posterior column damage?), together with the character of the spinal fluid abnormalities, indicate definitely that the patient has tabes dorsalis. Much more important, however, the nervousness, loss of weight, lassitude and insomnia suggest that in addition to tabes dorsalis he also has dementia paralytica and that the correct diagnosis is the tabetic form of dementia paralytica. The serologic reactions are compatible with this diagnosis.

The presence or absence of stigmas of congenital syphilis are not mentioned. Unless such stigmas are definitely present, it is highly improbable, even though the patient's father and mother also had syphilis, that his disease is congenital and much more likely that it is acquired. The average age at the onset of juvenile dementia paralytica is 13 years and, as pointed out by Menninger in his monograph (Juvenile Paresis, Baltimore, Williams and Wilkins Company, 1936) it is extremely unusual for the initial symptoms of juvenile dementia paralytica to begin after the age of 25. Less than 1 per cent of 542 patients studied by Menninger had juvenile dementia paralytica after this age.

The differentiation between the congenital and the acquired form of the disease is, however, of the utmost importance from two points of view: First, as to the patient himself: The prognosis of the acquired form of dementia paralytica is, with proper treatment, much better than in juvenile dementia paraly-

tica, in which with any form of treatment the outlook is relatively hopeless. Second, from the standpoint of the patient's family: If the patient has the acquired form of the disease there is a strong possibility that his wife and both children are also infected. If, on the contrary, he has juvenile dementia paralytica the wife and children have certainly escaped.

In order to settle the issue between acquired and congenital syphilis, it is essential first to know whether the patient has any stigmas of congenital syphilis; second, to examine his brothers and sisters, if he has any, in order to determine their freedom from infection. His wife and children should also be examined. If they are infected, it may be assumed that the patient's infection is acquired.

The important feature of the prognosis is that related to the paretic component of the patient's illness rather than to the tabetic. If he is not properly treated, there is a strong probability that he will shortly become insane and that he will die within a few years from dementia paralytica, thus putting an entirely different face on the situation than the chronic invalidism which might result if his illness were purely tabes dorsalis.

The patient should certainly be treated immediately with artificial fever, preferably with induced malaria; a tertian strain should be used and the patient should be allowed to have at least twelve paroxysms of fever. On the completion of fever, and after a short course of small tonic doses of a trivalent arsenical, preferably neoarsphenamine or mapharsen, treatment should be continued for a minimum period of two years with tryparsamide and a bismuth compound as outlined in chapter XXVI of the monograph by J. E. Moore, The Modern Treatment of Syphilis, Springfield, Ill., Charles C. Thomas, 1933.

## CONSTITUTIONAL PSYCHOPATHIC PERSONALITY

*To the Editor:*—A white man aged 23 is an adopted son and an only child. Nothing is known of his blood parentage, but the foster parents are cultured people and the home life has been ideal. The foster father is a lawyer. The patient had active tuberculosis in childhood, which cleared up after rest treatment was instituted. He became slow in his school work and because of this received a great deal of attention at home. Finally he finished high school and attended a junior college. Symptoms were first noticed at this boarding school. He became irresponsible; he lied but did not steal; he showed a lack of sustained interest; he wrote bad checks and signed his own names to them. He never mentioned this to his parents or to the bank on which he had drawn. His foster father usually took care of the checks but reprimanded the boy severely. He was given several jobs but did not hold any of them long. He was dismissed for being incompetent and inaccurate. He never worries in the least over not having a job. He contents himself by choosing undesirable companions and reading cheap literature. This certainly does not conform to the type of training and home life he has had. His foster parents are in moderate circumstances and are anxious to send him to school to complete his education. He has been referred to two neuropsychiatrists, both of whom called this a "borderline psychiatric case." I am not familiar with the term nor have I been able to find references to it. Can you give me references and indicate the prognosis of such a case? How should a case of this type be handled? Should the patient be reproved for lying and punished for writing bad checks? He always has the most feasible story to explain any of his actions and never hesitates to explain them, although his stories are invariably false. He continues to ask his parents for money but never tells them where he is going or what he expects to do with the money. His parents have been exceptionally good to him, yet he tells strangers how mean his mother is to him and how he hates to go home at night because of the unpleasantness there. He resents any discipline from his parents or any one else. Any help you can offer will be appreciated.

M.D., Mississippi.

ANSWER.—Although the material supplied is rather scanty, the patient would seem to fit into the grouping of constitutional psychopathic personality. Under this heading are included people who have been from childhood or early youth habitually abnormal in their emotional reaction or in their general behavior but who do not reach, except perhaps episodically, a degree of abnormality which would justify calling them psychotic and who usually show no intellectual defect. Nothing is really known of the etiology of these conditions although the psychoanalytic school has stressed the fact that such individuals lack superego (conscience) and emphasize the fact that there is never a normal relationship between father and son in these cases. The treatment is exceedingly difficult and must of course vary for the individual. In general these people can occasionally be helped if they can form some sort of attachment to an older person who can advise them as difficulties arise.

The prognosis is usually bad. The subject may be found discussed in any standard textbook of psychiatry and the entire problem has recently been admirably reviewed by Dr. D. K. Henderson of Edinburgh at the recent Salmon Memorial Lecture at the New York Academy of Medicine. The volume is to appear soon and is a noteworthy contribution to a difficult problem.

## DOSAGE OF GONAD STIMULATING HORMONES

*To the Editor:*—I am much interested in the use of anterior pituitary-like substance now so much in vogue in the treatment of nondescent of the testis. As a urologist I have had the opportunity of operating in about 180 cases. Recently I have operated on a group of boys who have had varying doses of the anterior pituitary-like substance, and I think I have observed degenerative changes in some of the testes. This is in accord with the experimental work of T. W. Mimpriss published in the *Lancet* March 5, 1938. My own experimental work was undertaken before this date, but I killed my rats too early to show the changes which he noted. My second group is not yet ready for examination. The American literature is full of reports in which the recommended total dose varies from 1,000 rat units to 112,300 rat units. A discrepancy so great I believe is significant and somebody must be wrong. I expect to publish the results of my experimental work and should like to ask for an opinion as to the appropriate dosage. Bigler has expressed the opinion that 4,000 rat units is the upper limit of safe dosage. The one case in which I have operated with this exact dose did not show gross degenerative changes.

J. S. EISENSTAEDT, M.D., Chicago.

ANSWER.—No standarized dosage (frequency and amount) of gonad stimulating agents (anterior pituitary-like) for clinical use has yet been adopted. It should be remembered that the total dose depends as well on the length of time administration is carried out as on the unitage employed for single injections. Since these water-soluble preparations are rapidly excreted, effectiveness of the preparation depends largely on the frequency of injection. Experiments on immature rats (from 15 to 35 days of age) with 100 units daily for a period of twenty days fails to cause degenerative changes in the testicle. Increased hormone production by the testes and increase in interstubular tissue is pronounced. Thompson and others (*Endocrinology* 22:59, 1938) report that doses equivalent to approximately 150 units daily over a month or longer in a 7 year old boy induced precocious maturity, a condition that should probably be avoided.

It is usually advisable to use moderate doses (from 300 to 500 rat units three times a week) and if the administration of these preparations has produced no favorable effect in a reasonable period, such as from six to eight weeks, continuation of the therapy is not indicated. This would avoid any possible danger which might exist from exceedingly high doses, but it must always be remembered that the present anterior pituitary-like products are chemically crude.

## SONNE DYSENTERY IN TWO YEAR OLD

*To the Editor:*—A boy aged 2 has been troubled with loose, watery stools four or five times a day for the last three months. At no time has he been acutely ill. There has been no vomiting, loss of weight or apparent discomfort. He has remained alert and active with good appetite and a good disposition. The stools have contained a slight amount of mucus but no blood either grossly or by the benzidine test. The child is comfortable and well nourished and weighs 33 pounds (15 Kg.). No evidence of dehydration is present; the temperature and pulse are normal; no tenderness or masses are evident in the abdomen. Cultures of the stool reveal a Sonne bacillus. The urine is normal. Hemoglobin is between 80 and 90 and the red blood corpuscles number 4,230,000 per cubic millimeter. Various diets have been tried, the most recent being a low fat, low protein, high carbohydrate diet of low residue. The child has been given paregoric, gelatin, bella-sans and kaolapectate. As long as this treatment is continued, the diarrhea is controlled. Without medication the diarrhea continues. What suggestions can be offered for treatment? What is the value of colonic irrigation in this type of case? Of serum therapy?

M.D., Connecticut.

ANSWER.—It must be assumed that, if a Sonne bacillus was isolated from the stools of this child, it is a case of bacillary dysentery.

The most effective diet for a child suffering from liquid stools is one which consists of high proteins, low fats and a moderate carbohydrate intake, with an adequate supply of vitamins. Protein milk, skimmed milk or whole milk enriched with from 5 to 7.5 per cent of calcium caseinate should be included in the diet. Banana powder may be added to the milk mixture, and ripe bananas are sometimes taken with beneficial results. Later on in the disease, cottage cheese, egg white, orange juice, a moderate quantity of raw apple, gelatin and lean scraped beef pan broiled may be given. Sometimes other vegetables may be added, though with great caution, and only one such substance should be added at a time. Bread or cereal should not be given until the diarrhea is under control. These patients have a low tolerance for carbohydrates and therefore sugars and sweets should be used sparingly. It is sometimes necessary to continue this diet in principle for a considerable time.

Serum therapy is effective only in cases of Shiga bacillus infection. The results of serum therapy in all other dysentery bacillus infections have been disappointing. The results with colonic irrigation also have been unsatisfactory, and as this procedure causes considerable discomfort and irritation it has come into general disuse.

## TRAUMA AND VOLVULUS

*To the Editor:*—In a discussion of volvulus among several physicians, the question arose whether trauma might be a precipitating cause of intestinal obstruction. A case was mentioned of a watchman in his sixties who lifted a heavy weight and subsequently complained of abdominal pain and vomiting. These symptoms increased in severity, he became obstipated, and after two weeks he consulted his physician. Intestinal obstruction was diagnosed and at operation volvulus of the splenic flexure of the colon with thrombosis of the contributory vessels was found. Adhesions between other parts of the intestinal tract were seen. There was no history of previous operations. The available literature was of little help. Would you please enlighten me as to the relationship of trauma, or great strain as in the case mentioned, to volvulus?

M.D., New York.

ANSWER.—There is frequently a history of trauma or unusual physical activity in torsion of a solid viscus which is predisposed to it by a narrow pedicle or a bulbous round tip. Because these predisposing conditions may exist over a long period it is believed that initiation of the torsion is due to hyperemia of the veins mechanically favoring rotation around the tense arteries, which act as a mesentery and produce a spiral out of the convex side. A rubber tube will produce torsion under similar circumstances. These factors may occur in a distended appendix or any free loop of bowel, although torsion in the freely movable small intestine is rare except when associated with a Meckel's diverticulum, which may produce a volvulus by dragging on the bowel or by its increased weight when distended. Torsion of any viscus or loop of bowel is favored mechanically by fixation of both ends, so that it rotates around itself on two fixed points, similar to a folded handkerchief held taut by two corners while the third corner is allowed to rotate.

There is good evidence that an acute trauma from outside the abdomen or pressure from within may produce torsion of either a solid viscus or a loop of bowel. In torsion of a solid viscus the twisting mechanism is believed to result from an initial hyperemia with venous stasis due to trauma. Torsion of a loop of bowel is further favored by mechanical distention of a loop of intestine with gas, liquids or solid material, by increased peristalsis or by stony, which may rapidly predispose and initiate torsion. Since the latter factors may occur not only as a result of trauma but also in its absence as a cause of volvulus, it is either frequently overlooked or rarely occurs as contrasted with its recognized importance in torsion of a solid viscus. Regardless of its frequency as a cause of volvulus, trauma may produce all the factors necessary and should be a more frequent cause of volvulus than of torsion of a solid viscus where distention and peristalsis do not occur, but it is admitted that volvulus may result more frequently from nontraumatic factors.

As a rule volvulus rapidly produces obstruction of the bowel at both ends and complete strangulation of its blood supply with an early plastic peritonitis, which is followed by an infectious peritonitis from gangrene of the loop of bowel and death in a few days unless relieved by operation.

## HAY FEVER FROM "COMPOSITE" POLLENS?

*To the Editor:*—What is the botanic name of the weed commonly known as "Spanish needle" or "beggar's lice"? This is a bright yellow flower growing profusely over the country. Is this plant capable of producing hay fever and if so, in a diagnostic and treatment set made by any of the biologic houses?

M.D., Illinois.

ANSWER.—While no one would dare give a definite answer as to the identity of a plant without a specimen of the plant in hand, it is quite likely that the plant referred to is one of the species of tickseed-sunflower, either Bidens coronata (L.) Britton, Bidens trichosperma (Michx.) or Bidens involucrata (Nutt.) Britton. These plants, variously known as beggar-ticks, beggar-lice, marsh marigold, bear wedge shaped achenes crowned with two short stout awns, whereas true Spanish needles (Bidens bipinnata, L.) bear spindle shaped achenes tipped with two, three or four barbed awns. The flowers of true Spanish needles are not conspicuous, often having no petals at all.

The pollen of this plant is capable of producing hay fever reactions and positive cutaneous reactions on persons sensitive to ragweed but one can get in contact with it only by direct handling of the plants. The pollen is heavy and suited only for insect transfer. There are no records of specific sensitiveness to any member of the Bidens genus and no record of Bidens pollen ever having been found on atmospheric pollen slides exposed in any part of the United States. Pollen from this genus should not be regarded as of any more importance than that of any of the other composites. Britton states in his "Illustrated Flora of the United States and Canada" that there are 800 genera and not less than 10,000 species of the composites. This does not include members of the lettuce family, of which there are an additional 1,500 species. It is quite likely that the pollen of any of these 11,500 plants would give positive reactions of varying degree on almost any ragweed sensitive person. Allergists agree that the active element in ragweed pollen is, as far as is known, shared by the pollen of all the composites. Furthermore, they generally agree that desensitization with ragweed pollen extract should protect a patient from any chance contact with small amounts of composite pollen. Only in rare cases in which a sensitized person is engaged in direct handling of unusual plants is it felt necessary to test with or include such pollens in desensitization treatment sets. Skin tests and pollen extract of Bidens involucrata can be obtained from Abbott Laboratories, North Chicago.

## KÖHLER'S DISEASE IN ADULT OR ARTHRITIS

*To the Editor:*—A well nourished man aged 30, whose family history is negative, for the last five years has had pain in the right foot when he is on his feet. The left foot does not trouble him. Both feet appear flat in the longitudinal arch; there is slight adduction flexion and extension of foot normal range, but flexion is painful; adduction and abduction or eversion is zero and painful. X-ray examination shows irregular appearance of the dorsal surface of the anterior part of the astragalus and scaphoid and internal cuneiform. The scaphoid from the anterior view on both sides is narrowed and the astragalus scaphoid articulation shows denser outline of the scaphoid, suggesting Köhler's disease. Is this diagnosis right and what about Köhler's disease in adults? What is the treatment? C. C. RINARD, M.D., Homestead, Pa.

ANSWER.—Köhler's disease, first described in 1908, is seen only in children and adolescents. From the history and the x-ray appearances one would suspect an arthritic condition. A search for foci of infection should be made and syphilis must be ruled out.

Conservative measures are indicated, such as protection in sensible shoes with a good firm shank and heat to relieve pain. If there is swelling, the patient should sleep with the foot and leg elevated. Frequent enough x-ray examination is essential to determine whether there is any extension of the lesion. Fixation in a plaster cast is generally contraindicated in cases of this kind because of the resulting osteoporosis.

## DANGERS FROM CHLORINATED DIPHENYL PREPARATION

*To the Editor:*—A patient has acute pericarditis with effusion associated with slight fever and leukocytosis. There is no cough and no sign of bronchial irritation. No cause can be found. The man has been working for five years as a special automobile mechanic for an oil company. One part of his work consists of using a substance called Solvenized Concentrate, made by the Dow Chemical Company, in the carburetor of the car. It is said to be a chlorine derivative of diphenyl. This substance is placed in the carburetor and the motor is allowed to run for some time. There is a great deal of smoke from the exhaust, to which the patient is constantly exposed. I do not see how it is possible for the inhalation of any gas to cause the trouble I have described, especially since there has been no bronchial irritation, but I would much appreciate an opinion on this and any information you might have on the possible poisoning from the substance described.

WILLIAM C. STEPHENSON JR., M.D., Roanoke, Va.

ANSWER.—It is unlikely that a chlorinated diphenyl preparation would cause the condition described. If nitrobenzene by mouth arbitrarily is associated with a toxicity rating of 1, diphenyl may be rated at 4 plus and 2-chlorodiphenyl at 2.5. These are the figures furnished by Smyth (The Toxicity of Certain Benzene Derivatives and Related Compounds, *J. Indust. Hyg.* 13:87 [March] 1931), who has carried out extensive experimental work with diphenyl and diphenyl derivatives. Drinker and his associates, in a symposium on certain chlorinated hydrocarbons, presented before the Harvard School of Public Health, Boston, June 30, 1937, reported extensive experiments with chlorinated diphenyls. In part, they concluded, "These experiments leave no doubt as to the possibility of systemic effects from the chlorinated naphthalenes and chlorinated diphenyl. . . . It is most remarkable too that all the compounds tested attack the liver and the liver alone. . . . On the basis of these experiments and on many field determinations of different compounds in the air of workrooms, it appears safe and it is certainly easily attained to ventilate so that the air breathed does not contain more than 0.5 mg. per cubic meter of any of these compounds above trichlornaphthalene." Reference to these two cited publications will furnish much additional information on the toxicity of chlorinated diphenyls. Even though no connection can be established in the present instance with a chlorinated diphenyl, the description of the operation furnished in the query suggests that this practice may be undesirable and that harm might arise. This patient, if only recently removed from exposure, should be examined to determine any disturbance in liver function. In many respects this form of intoxication resembles that from phosgene.

### TREATMENT OF CHRONIC UNDULANT FEVER

*To the Editor:*—What is considered the most satisfactory treatment for chronic undulant fever with localized infection?

FRANK E. WIEDEMANN, M.D., Terre Haute, Ind.

ANSWER.—Several apparently satisfactory methods of treatment are now being employed in cases of chronic undulant fever (brucellosis). Brucella melitensis (abortus) vaccine (N. N. R.) appears to exert a favorable influence in a high proportion of cases. The response to vaccine therapy has been best in those patients who have experienced systemic febrile reactions following injections of the vaccine. In occasional refractory cases it may be necessary to increase the dosage beyond the 1 cc. which is usually regarded as a maximum dose.

Artificial fever therapy has been used successfully in the treatment of several cases of chronic undulant fever by Prickman, Burnett and Kjusen (Treatment of Brucellosis by Physically Induced Hyperpyrexia, Proc. Staff Meet., Mayo Clin. **13**:321 [May 25] 1938). Ervin and Hunt (The Diagnosis and Treatment of Undulant Fever, THE JOURNAL, Dec. 11, 1937, p. 1966) found that the production of sharp thermal reactions with intravenous injections of typhoid-paratyphoid vaccine usually shortened the course of the disease.

Successful results have been reported following the use of a broth filtrate of Brucella organisms, known as "brucellin," developed by I. F. Huddleson, Michigan State College, East Lansing, Mich. More recently, Stern and Blake (Undulant Fever: Its Treatment with Sulfanilamide, THE JOURNAL, May 7, 1938, p. 1550) and Blumgart (Recovery of a Patient with Undulant Fever Treated with Sulfanilamide, THE JOURNAL, Aug. 6, 1938, p. 521) have used sulfanilamide in the treatment of a few patients with acute or subacute undulant fever, with apparently prompt and favorable results.

### IRITIS FROM SCISSORS

*To the Editor:*—Six weeks ago a girl aged 17 years had a perforating wound of the cornea just below the pupil, having jabbed the point of a pair of scissors into the eye while sewing. There appeared to be little or no damage to the iris and the lens; the eyeball was somewhat softened. Treatment has consisted of the use of White's ointment and a firm bandage. The eye seemed to do well and the sight has steadily improved, but on the last visit the sclera seemed somewhat more congested than it had recently been and the eyeball appeared to be just a little smaller than the other. There has at no time been any great amount of exudate in the anterior chamber, nor has there been any excessive amount of pain. What are the chances of atrophy of the eyeball and loss of sight? What are the chances of sympathetic ophthalmia?

M.D., West Virginia.

ANSWER.—A simple perforating injury of the cornea without subsequent purulent infection of the eyeball and without traumatic iritis never leads to an atrophy of the eyeball or phthisis bulbi. However, from the description, it appears that there is an iritis, probably increasing in amount, judged by the evident thickening of the lids and decreased palpebral aperture and by the increased ciliary hyperemia. Consequently there must have been some injury to the iris and as a result there is a definite danger of sympathetic ophthalmia. More active treatment is indicated in the form of complete atropinization, use of sodium salicylate and foreign proteins.

### FORMALDEHYDE DISINFECTION OF SHOES

*To the Editor:*—I was much interested in the article "Removing Formaldehyde from Leather," in the July 30 issue of THE JOURNAL. Formaldehyde is recommended for disinfecting shoes in cases of ringworm. The author failed to state what method should be used to eliminate objectional features of formaldehyde. I used this drug in my own case last week, putting on my shoes the next morning and as a result suffered severe burns and deep fissures on the soles and between the toes. 1. What is the best method to disinfect shoes? 2. Is roentgen therapy a good method for treatment of ringworm of the feet, and what is the usual dosage and frequency of application? 3. Can the formaldehyde be neutralized in shoes sufficiently to prevent harm to feet? How? 4. What is the treatment for fissures resulting from formaldehyde?

M.D., Ohio.

ANSWER.—Formaldehyde for disinfecting the shoes in fungous infections has been widely used and generally approved. It is necessary that the shoes be thoroughly aired after exposing them to the action of this agent. A two day interval after application generally proves satisfactory. Probably this interval could be considerably shortened if a stream of air was blown through the shoes or if a fan was placed in front of them.

1. This remains an open problem, but it is probable that the chemical method is as practical as any.

2. X-rays are frequently used by dermatologists for treating eczematoid ringworm of the feet, but their use should be limited to those thoroughly acquainted with this modality.

3. The most practical way of getting formaldehyde off the shoes is by evaporating by exposure of the shoes to the air.

4. If the dermatitis and fissures resulting from the use of formaldehyde are severe, wet dressings of aluminum subacetate solution 0.5 per cent may be used early. When the acuity of the disorder subsides, boric acid ointment or similar bland material may succeed this. After the condition becomes stationary, the use of a modified Whitfield ointment may be cautiously begun. This would consist of about 1 to 2 per cent salicylic acid and 2 to 3 per cent benzoic acid in petrolatum. The concentration of these ingredients may be increased as the process warrants.

### DEXTROSE TOLERANCE TEST

*To the Editor:*—A white woman aged 57, known to be diabetic for ten years, who one month previously had been in diabetic coma, had at the time of a dextrose tolerance test an active right pyelitis. A dextrose tolerance test was given, 100 Gm. of dextrose being administered by mouth. The following blood sugar determinations were obtained: fasting, 400 mg. per hundred cubic centimeters; one hour, 575 mg.; two hours, 660 mg.; three hours, 735 mg.; four hours, 675 mg. The patient at the time of the test was taking 80 units of insulin daily. Was this not a dangerous and unnecessary test to perform in such a patient?

M.D., Arkansas.

ANSWER.—It was not a dangerous test to perform because undoubtedly the patient was taking 100 Gm. of carbohydrate daily and it simply meant that she was given the 100 Gm. in a short time. Often after operations one gives 1,000 cc. of physiologic solution of sodium chloride intravenously with from 50 to 100 Gm. of dextrose even though the blood sugar may be temporarily high. Such an injection might be postponed until the blood sugar drops, but one usually prefers to permit transient hyperglycemia rather than to have the patient go twelve or even twenty-four hours subsequent to operation without carbohydrate. By the use of insulin at frequent intervals the hyperglycemia can be easily controlled.

Whether it was unnecessary to give the dextrose tolerance test, as one might be tempted to conclude, would be improper to say without knowing all the circumstances which the doctor had in mind at the time he gave the test.

### PNEUMOTHORAX REFILLS IN EUROPE

*To the Editor:*—A patient who has been having pneumothorax treatments for tuberculosis for the last two and a half years is now having a refill every three weeks. She wishes to take a trip abroad and wants to know where refills can be obtained in France, Germany, Austria, Switzerland and Italy.

M.D., Illinois.

ANSWER.—There will be no difficulty in receiving artificial pneumothorax treatments while abroad. Excellent collapse therapy work is done in all the places mentioned. The following physicians are well qualified:

In France, Dr. Edouard Rist, médecin des hôpitaux de Paris, 5 rue de Magdebourg, Paris, 16e; in Germany, Dr. Walter Unverricht, Leiter der III med. Univ. Poliklinik, Kaiserallee 23, Wilmersdorf, Berlin; in Austria, Dr. Ludwig Hofbauer, Leiter der Atmungspathologischen Abteilung, I. Medizinischen Klinik, Vienna; in Italy, Dr. Federigo Bocchetti, Direttore del Sanatorio Bernardino Ramazzini de Roma, Via Nazionale, 22, Rome; in Switzerland, Dr. E. Bachmann, Kirchgasse 36, Zurich I, or Dr. Marc Jaquerod, directeur du Sanatorium du Grand Hotel, Leysin (Ct. de Vaud).

### VARICOSITIES OF LIPS AND FACE

*To the Editor:*—I have been consulted by a middle aged man about a small varicosity protruding downward about 3 mm. from the mucosa of the upper lip; it is approximately 3 mm. in diameter. What success can I anticipate in the obliteration of this mass by the perivenous injection of small amounts of a mild sclerosing fluid, such as sodium psylliate fluid?

M.D., Missouri.

ANSWER.—Small vascular dilatations on the lips may readily respond to an injection of a few drops of some mild sclerosing solution into the mass but not around it. A traumatic etiology is likely. One should always look for vascular masses below the buccal mucous membrane, in the substance of the upper lip, in the cheeks or in the bony structures, as often a large vascular anomaly may be hidden behind an innocuous, cutaneous varix. If vascular nevi are present in other regions of the face, the suspicion of a congenital vascular anomaly may be aroused. Certain slowly growing malignant neoplasms may produce venous compression and manifest themselves in an early venous engorgement. If radium is available, it will shrink the vascular mass effectively.

# Medical Examinations and Licensure

## COMING EXAMINATIONS

### STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, October 15, page 1495.

### SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral.* St. Louis, Nov. 11-12. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: Written examinations will be held in various parts of the United States, Feb. 20. Application must be received on or before Jan. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada, Nov. 5 and Feb. 4. General oral, clinical and pathological examinations for all candidates (Groups A and B) will be given in St. Louis, May 15-16. Applications must be filed not later than sixty days prior to date of examination. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: St. Louis, May 15. Applications must be filed before February 15. Sec., Dr. John Green, 3720 Washington Blvd., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Memphis, Tenn., January. Sec., Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF PEDIATRICS: Detroit, October 26; Rochester, N. Y., November 13; and Oklahoma City, November 15. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 28-30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: St. Louis, May 11-14. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF UROLOGY: New York, Jan. 13-15 Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

### NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Part III. Baltimore, Oct. 25-27, and Boston, Nov. 1-3. Med. Sec., Dr. J. Stewart Rodman, 225 S. 15th Street, Philadelphia.

## Wisconsin June-July Report

Dr. Henry J. Gramling, secretary, Wisconsin State Board of Medical Examiners, reports the written and practical examination held at Milwaukee, June 28-July 1, 1938. The examination covered twenty subjects and included 100 questions. An average of 75 per cent was required to pass. Ninety-nine candidates were examined, all of whom passed. Twenty-eight physicians were licensed by reciprocity. The following schools were represented:

| School | PASSED | Year Grad. | Per Cent |
|---|---|---|---|
| University of Arkansas School of Medicine | | (1937) | 84 |
| College of Medical Evangelists | | (1938) | 82 |
| University of Colorado School of Medicine | | (1934) | 88* |
| University of Georgia School of Medicine | | (1937) | 85 |
| Loyola University School of Medicine | | (1938) | 85, 85 |
| Northwestern University Medical School | | (1938) | 81, 84, 86, 86, 88, 89 |
| Rush Medical College | | (1937) | 84, 84, 85, 88 |
| School of Medicine of the Division of Biological Sciences | | (1937) | 86 |
| University of Illinois College of Medicine | | (1938) | 86, 86, 87 |
| University of Louisville School of Medicine | | (1937) | 86, 84 |
| Tulane University of Louisiana School of Medicine | | (1937) | 82 |
| Harvard University Medical School | | (1935) | 80, (1937) 83, 84, 85, 86 |
| University of Minnesota Medical School | | (1938) | 84 |
| University of Nebraska College of Medicine | | (1937) | 80 |
| University of Rochester School of Medicine | | (1937) | 82 |
| University of Cincinnati College of Medicine | | (1938) | 84 |
| University of Oregon Medical School | | (1936) | 86 |
| University of Pennsylvania School of Medicine | | (1937) | 84, 85 |
| Marquette University School of Medicine | | (1938) | 80, 80, 80, 81, 81, 82, 82, 82, 82, 83, 83, 83, 83, 84, 84, 84, 84, 84, 84, 85, 85, 85, 86, 86, 86, 86, 86, 87, 87, 88, 89 |
| University of Wisconsin Medical School | | (1935) | 83, (1936) 83, 85, 86, 88, (1937) 81, 81, 83, 83, 84, 84, 84, 84, 84, 84, 85, 85, 85, 85, 85, 85, 86, 86, 86, 86, 87 |

| School | LICENSED BY RECIPROCITY | Year Grad. | Reciprocity with |
|---|---|---|---|
| George Washington University School of Medicine | | (1933) | Ohio |
| Dearborn Medical College, Chicago | | (1904) | Illinois |
| Loyola University School of Medicine | | (1937) | Illinois |
| Northwestern University Medical School | | (1910), (1937) | Illinois |
| Rush Medical College | | (1922), (1936) | Illinois |
| School of Medicine of the Division of Biological Sciences | | (1933) | Kansas |
| University of Illinois College of Medicine | | (1934), (1936, 2), (1937, 2) | Illinois |
| Tulane University of Louisiana School of Medicine | | (1932) | Louisiana |
| Johns Hopkins University School of Medicine | | (1931) | Penna. |
| Univ. of Minnesota Medical School | | (1927), (1928), (1935) | Minnesota |
| St. Louis University School of Medicine | | (1936) | Missouri |
| Washington University School of Medicine | | (1934), (1936, 2) | Missouri |
| University of Nebraska College of Medicine | | (1929), (1935) | Nebraska |
| University of Oklahoma School of Medicine | | (1932) | Oklahoma |
| University of Pennsylvania School of Medicine | | (1931) | Ohio |
| Marquette University School of Medicine | | (1937) | Ohio |

* License withheld pending completion of internship.

## Utah June Report

Mr. S. W. Golding, director, Department of Registration, reports the written examination held by the State Board of Medical Examiners at Salt Lake City, June 27-29, 1938. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. Twelve candidates were examined, all of whom passed. Six physicians were licensed by reciprocity and one physician was licensed by endorsement. The following schools were represented:

| School | PASSED | Year Grad. | Per Cent |
|---|---|---|---|
| University of Colorado School of Medicine | | (1938) | 83* |
| George Washington University School of Medicine | | (1937) | 83, 85 |
| Northwestern University Medical School | | (1938) | 84, 85 |
| Rush Medical College | | (1937) 80, 82, | 84,* 85 |
| University of Louisville School of Medicine | | (1937) | 83 |
| Harvard University Medical School | | (1935) | 86 |
| Washington University School of Medicine | | (1938) | 81* |

| School | LICENSED BY RECIPROCITY | Year Grad. | Reciprocity with |
|---|---|---|---|
| University of Colorado School of Medicine | | (1937) | Colorado |
| Northwestern University Medical School | | (1937) | Illinois |
| State University of Iowa College of Medicine | | (1937) | Iowa |
| Washington University School of Medicine | | (1934), (1936) | Missouri |
| University of Nebraska College of Medicine | | (1934) | Nebraska |

| School | LICENSED BY ENDORSEMENT | Year Grad. | Endorsement of |
|---|---|---|---|
| George Washington University School of Medicine | | (1936) | N. B. M. Ex. |

* License withheld pending completion of internship.

## Virginia June Report

Dr. J. W. Preston, secretary, Board of Medical Examiners of Virginia, reports the written examination held at Richmond, June 22-24, 1938. The examination covered eight subjects and included eighty questions. An average of 75 per cent was required to pass. One hundred and fifteen candidates were examined, all of whom passed. Twenty-seven physicians were licensed by reciprocity and nine physicians were licensed by endorsement. The following schools were represented:

| School | PASSED | Year Grad. | Per Cent |
|---|---|---|---|
| University of Arkansas School of Medicine | | (1936) | 86 |
| Georgetown University School of Medicine | | (1937) 83, | (1938) 85 |
| Howard University College of Medicine | | (1937) 78, | 79 |
| Rush Medical College | | (1938) | 82 |
| Temple University School of Medicine | | (1938) | 84 |
| Woman's Medical College of Pennsylvania | | (1937) | 82 |
| Medical College of Virginia | | (1936) | 82, (1938) 78, 78, 79, 79, 79, 79, 80, 80, 80, 80, 81, 81, 81, 81, 81, 81, 82, 82, 82, 82, 82, 83, 83, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 85, 85, 85, 85, 85, 85, 85, 86, 86, 86, 86, 87, 87, 87, 88, 88, 88, 89, 90 |
| University of Virginia Department of Medicine | | (1938) | 77, 79, 79, 79, 80, 82, 82, 82, 82, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84

# Book Notices

**A Textbook of Gynecology.** By Arthur Hale Curtis, M.D., Professor and Chairman of the Department of Obstetrics and Gynecology, Northwestern University Medical School, Chicago. Third edition. Cloth. Price, $7. Pp. 603, with 318 illustrations chiefly by Tom Jones. Philadelphia & London: W. B. Saunders Company, 1938.

Here is a volume which may well serve as a model for gynecologic textbooks of the future. From the beginning the reader realizes that the author is drawing on his mature experience and an intimate knowledge of the literature, and not on hearsay and hand-me-downs. He has succeeded in covering the essentials of gynecologic knowledge concisely and adequately. His long experience as a clinician has enabled him to compile his book with a fine sense of proportion; for example, thirty-eight pages are given to gonorrhea, three pages to endometritis. Only the section on urology in gynecology seems unduly condensed. The writing is excellent, always clear, often elegant. It is easy and pleasant reading. The best American opinion has been summarized with almost no personal bias. Yet Dr. Curtis has retained his own voice and in many places has gracefully disagreed with the consensus. In each such instance he has taken pains that his dissenting opinion shall be regarded as an individual, and not as a generally accepted, belief. The tone of the volume is forcefully conservative. One feels that only after long disappointment with conservative methods has the author been willing to accede to any radical procedure. An exception to this conservatism is his intimation that surgery may be preferable to radium in the treatment of very early carcinoma of the cervix. The reviewer takes no issue with Dr. Curtis's beliefs but does feel strongly that his textbook is not the proper place to express an opinion which may lead to a dangerous reversal in gynecologic practice. So uniform is the high quality of the work that it is difficult to cite the "best" features. Possibly the first section of the book is most satisfying. Here the anatomy of the female pelvis is presented as every gynecologist wishes to see it: academic anatomy, physiology, pathology, pathologic anatomy and surgical aspects equally emphasized. Dissections undertaken especially for this textbook have clarified several poorly understood relations. The illustrations by Cassell, McHugh and Jones and the photographs are excellent; the photomicrographs are fair. The references, which are generous, include the full title of the quoted articles, a practice to be highly commended. This textbook is suitable for undergraduates but will be of particular value to interns. It should be read by every physician who treats gynecologic diseases. When he finishes the volume the reader will wonder whether 600 pages could possibly contain a finer exposition of fact, experience and good judgment in gynecology.

**La fibrose pulmonaire des mineurs.** Par Louis Cretaine, médecin des hospices de Saint-Etienne, Rémy Martin, médecin-chef des dispensaires départementaux d'hygiène sociale de la Loire, et Albert Policard, professeur à la Faculté de médecine de Lyon. Paper. Price, 105 francs. Pp. 214, with 108 illustrations. Paris: Masson & Cie, 1938.

The book is based on clinical, roentgenographic and postmortem examination of a group of coal miners. Without giving data on the nature of the coal or dust concentrations, the authors have accepted employment records of work in rock or coal and attempted to differentiate the pulmonary reactions resulting from inhaling the two kinds of dust. They fail to point out, however, that the anthracosilicosis with which they have dealt may be different from that in other industries in which coal dust is not present. They have not been able to classify the roentgenologic appearances according to any of the generally accepted schemes but describe them in the following groups: ill defined diffuse shadows; nodular shadows; unilateral or bilateral dense shadows; pseudo-tumor-like shadows. The picture of linear exaggeration, called in South Africa "more fibrosis than usual" they were not able to identify.

They failed to find the roentgenogram as valuable an aid in diagnosis as most other observers have done. In fact they conclude that, while it is of value in establishing the existence of a pulmonary lesion, it cannot determine the nature of the lesions. They argue that, since individual tubercles and silicotic nodules have similar morphology, they must cast identical shadows. No reference is made to the difference in distribution and the resultant disease patterns on which most roentgenologists rely so strongly nor do they mention differences in the evolution of the pathology of silicosis and tuberculosis. They do admit that serial roentgenograms are more helpful than single films but even these they use merely as a check on the clinical and bacteriologic evidences of disease.

The fact that many of the miners who were reported to have worked in rock for years showed no evidence of disease convinced them that variations in individual susceptibility must have been present in others who did acquire silicosis. The high frequency of obvious tuberculosis among the group as a whole convinced them that this was the variable factor responsible for the susceptibility of the miners who exhibited silicotic nodulation. They therefore adopted the idea held by older observers that silicotic nodulation is always associated with an element of infection. A novel explanation is proposed for the evolution of the disease as either discrete nodulation or as manifest tuberculosis complicating silicosis. In the first instance the authors suggest infection with attenuated tubercle bacilli, in the second with organisms of full virulence. They even propose to institute hygienic dietetic treatment of the cases with generalized nodulation in the hope that the infectious element will heal and the nodules disappear.

The well recognized frequency of so-called conglomerate fibrosis in coal miners has made their problem difficult, but they do not adopt the concept of "silicotuberculosis" as ordinarily accepted. Atelectasis from bronchial occlusion in their minds is responsible for many of the massive areas of fibrosis.

**Immune-Blood Therapy of Tuberculosis with Special Reference to Latent and Masked Tuberculosis.** By Joseph Holitz, M.D. Cloth. Price, $2. Pp. 197. New York: The Author, 1938.

The author has had a stormy course. In an introduction of approximately ten pages he describes how his point of view was developed and how he began to experiment with immune blood in 1908. However, when he presented his work to the medical world it was severely attacked. Only rarely did he find a physician who gave it any consideration. He first published a book entitled "Tuberculous Intoxications," from Budapest. In 1911 his book was awarded a prize of a thousand francs by the Academy of Medicine in Paris. He claims that about the time his ideas were to be accepted in Germany Dr. Graefenberg reaped the benefit, when a German medical congress in Wiesbaden handed him the laurels.

After the World War he was about to undertake the task of freeing Budapest of tuberculosis in a twenty year period, but the failure of the political party with which he was alined put an end to this undertaking. A little later the Tuberculosis Association of Hungarian Physicians expelled him from membership. In order "to escape imprisonment or murder" he emigrated, finally reaching the United States. New York was the eighth place in which he settled after leaving Budapest. In America he found that the treatment of tuberculosis was decades behind that of Europe. Despite the fact that he believed he could free any metropolis of tuberculosis by his immune-blood therapy in a short time, he was unable to obtain a position in any hospital or sanatorium as a tuberculosis specialist. Even his manuscripts were rejected by the American medical journals. He could not find a place on first class medical programs. He had a question sent to THE JOURNAL concerning immune blood but it was returned with a statement to the effect that investigation had shown such therapy in tuberculosis to be ineffective. When his work was not accepted in American medical journals he found a publisher in Edinburgh, Scotland, who published a book for him under the title of "Tuberculous Intoxications: Concealed and Masked Tuberculosis." This appeared in 1928, after seven American publishers had returned his manuscript. He sent copies to well known physicians and numerous medical institutions and especially called it to the attention of the Health Commissioner of the city of New York. In his introduction he states that he was told that the National Tuberculosis Association does not like new ideas and, therefore, "put thumbs down on the book

and prevented its circulation." Two years later he learned that only seventy copies of his book had been sold in the entire United States. Ten years have now passed since the appearance of his last book and the author feels it necessary "to communicate again with the medical world."

The subject matter of this volume is of such a nature that the book will probably be received with as little enthusiasm as the previous book, if not less. So little has actually been proved about immunity in tuberculosis that it is impossible to understand the rationale of such treatment. The author's immune blood is obtained from "immunized" rabbits. His preparation is administered in two ways: He gives a subcutaneous injection every two or three weeks and during the interim the patient rubs some of the material into the skin once every day or so. In connection with this, which he calls specific treatment, he believes that rest, hygienic and dietetic treatment are also advisable. However, he claims excellent results in many cases without the patient discontinuing his work. The author cites seventy-eight cases, in a good many of which the evidence of tuberculosis is so flimsy as to leave considerable doubt in the mind of the reader as to whether this disease actually existed in clinical form. He cites the cases of some children who from the evidence presented would appear to have had nothing more than primary tuberculosis complexes. A series of patients suffering from neurasthenia, rheumatism, thyrosis, dementia praecox, epilepsy, dysmenorrhea, disturbances of the digestive system and other symptom complexes was treated with immune blood on the ground that these conditions were due to tuberculous lesions somewhere in the body and the later abatement of symptoms is presented as proof of the specificity of this treatment. Every clinician who has had an extensive experience in tuberculosis therapy can select from his files as many or more cases that responded in a similar manner as those here cited in the absence of immune blood administration. Many tuberculous lesions enter on long periods of remissions without any treatment whatever. The nature of tuberculosis is such that the citation of only seventy-eight cases with such a large variety of symptoms and so little evidence of the disease having existed in clinical form in many of them proves nothing.

**Typhoid Fever on the Witwatersrand: Bacteriological Aspects, Serological Diagnosis, Specific Prophylaxis and Specific Treatment.** By W. Lewin, M.D., B.Ch., D.P.H. Thesis Accepted for the Degree of Doctor of Medicine in the University of the Witwatersrand, Johannesburg. Publications of the South African Institute for Medical Research. No. XLI. Vol. VII. Edited by the Director. Paper. Pp. 413-536, with 25 illustrations. Johannesburg: The Institute, 1938.

The observations recorded in this monograph are considered under four headings noted in the title. The work which forms the basis of the report was carried out among native mine workers in an area where typhoid is widely prevalent. As the author states, the workers lived under "herd" conditions. Food was served to several thousand from one kitchen. The sewage disposal was crude, the bucket system being used underground. The miners were largely non-Europeans, who worked in the mines an average of nine months, thereafter returning to their native "kraal." Some 300,000 men were thus employed, among whom the carrier rate was 2 per cent.

The section on bacteriologic aspects deals largely with strains isolated from blood and excreta, classified according to the method of Kaufman. The majority of strains were found to belong in Kaufman's V-W group, containing Vi antigen. The V type with a preponderance of Vi antigen was found infrequently (eighteen of 299 strains), while the W type with Vi antigen absent (four of 299 strains), was recovered still less frequently. The work of Felix and others concerning the agency of Vi antigen in determining mouse virulence and immunizing potency is confirmed; the author finds as do others that there is the discrepancy between the observed severity of the disease and the virulence of the infecting organism; that is, there is no correlation between the high pathogenicity that strains rich in Vi antigen exert on mice and the moderate course of the infection in human beings from whom strains rich in Vi antigen have been isolated.

The section on serologic diagnosis is largely given over to a consideration of O and H agglutination titers. An attempt is made to determine a diagnostic level, and this the author fixes at 1:100 for the H antigen and 1:200 for the O antigen. These titers he adopted because (*a*) a false positive was likely to be ruled out and (*b*) a clinical attack of typhoid generally results in titers higher than those adopted. He tested his diagnostic titers by agglutination tests in two series of cases admitted to the hospital with the diagnosis of enteric fever. There was a high correlation noted between the cases in which Bacillus typhosus was isolated from blood or excreta and the author's diagnostic agglutination titers.

In the section on prophylaxis the "typhoid endotoxoid" of Grasset (prepared by formolization of frozen and thawed bacterial suspensions) is compared with oral typhoid tablets prepared from the same strains and with TAB vaccine. The results with oral administration of typhoid vaccine were poor and confirms the work of others. The author concludes from his observations and the work of others on the inoculation of mine personnel that the vaccine of choice is "typhoid endotoxoid" for the reason that it is efficacious and because there is a minimum of general reactions following its use.

Serum therapy was used in sixty-two cases, and these are compared with 625 controls. Because of the small number of cases treated, age and sex were not considered. Although the case mortality was somewhat lower among the serum treated, the conclusion that it is significantly different in the two groups is hardly warranted, particularly with such a disproportion between serum treated and controls, the while ignoring age and sex. A small series of cases were treated with serum in which Vi antibodies were included. Brief case reports and fever charts are appended. Results appear encouraging. Finally, a small number of cases treated with increasing doses of "typhoid endotoxoid" vaccine is recorded, apparently resulting in a reduction in the mortality rate. The use of serum followed by inoculation with "typhoid endotoxoid" is mentioned as a possible means of treatment of known cases.

Much effort has been expended in the preparation of this monograph. For some studies too few observations are recorded, and one wonders whether a consideration of fewer aspects of the problem might not have resulted in more conclusive studies rather than in a work which apparently confirmed that of others but which by itself appears only indicative. This criticism appears more pertinent in the light of the unexcelled opportunity for study afforded by the incidence of typhoid among so large a group of mine workers.

In many instances, references to the work of others applied to the particular phase of the work discussed is given, and section bibliographies are ample. This is desirable, but when in the instance of agglutination studies the ". . . investigation was carried out primarily to confirm the results obtained by Felix and his co-workers on the antigenic properties of B. typhosum in regard to the Vi antigen . . ." one wonders what effect wishful planning has had on some of the work here reported. Finally, the investigative opportunity afforded by a high prevalence of typhoid creates a difficulty with respect to certain phases of the study, particularly serologic diagnosis. Where it is impossible to determine accurately whether persons have a negative history of typhoid or of previous inoculation against the disease, the question of subclinical infection cannot be ruled out, thus affecting controls utilized in certain comparisons.

This monograph should be read by all whose clinical, laboratory or administrative duties involve contact with one or more phases of the typhoid problem.

**A Textbook of Clinical Pathology.** Edited by Roy R. Kracke, Emory University, Ga. Cloth. Price, $8. Pp. 847, with 230 illustrations. Baltimore: William Wood & Company, 1938.

The late Foster M. Johns of Tulane University had organized and nearly finished the work of this book at the time of his death in 1936. It represents the cooperative efforts of twelve different contributors, brought to completion under the editorship of Roy R. Kracke of Emory University. The use of multiple authors in the writing of a textbook of clinical pathology is commendable. There is probably no clinical pathologist today who is so thoroughly grounded in physiologic chemistry and serology and hematology, for instance, that he could be considered a first rank authority in all these fundamental branches of clinical pathology. Yet those who

expect to find in this book something altogether new or extraordinary will be disappointed. The book has distinct merit but, taken as a whole, it is not exceptional.

The introduction to each subject clearly states the problems to be considered and their importance. Following descriptions of methods and technic there is usually a discussion on the interpretation of the results. These explanatory paragraphs are usually clear, concise and inclusive. The chapters on hematology are especially good. In thoroughness and lucidity they are probably not excelled in works similar to this. They occupy nearly half of the book. The chapters dealing with bacteriologic methods also are excellent. They are unusually complete, and the methods given are exceptionally well chosen. Unfortunately, this material is rather scattered. The chapters on sputum and urinalysis are unduly brief. Indeed, they are nearly inadequate. This is perhaps the result of efforts to confine the book to its present convenient size. Some of the newer tests, such as those for alcohol, bromide and heterophile antibody are included; but other simple and relatively important tests, such as those for sulfanilamide and amyloidosis are omitted. Serologists may protest the inclusion of the syphilis tests of Johns and Laughlin in preference to the more generally recognized tests of Hinton and Eagle. An excellent feature is the inclusion of a list of original references at the end of each of the principal sections of the book.

This book is not an important addition to the already rather well loaded laboratory bookshelf but it is a good book and will no doubt become popular with the students, clinicians and small hospital laboratories for which it was written.

**Handbuch der experimentellen Pharmakologie. Begründet von A. Heffter. Ergänzungswerk. Herausgegeben von W. Heubner, Professor der Pharmakologie an der Universität Berlin, und J. Schüller, Professor der Pharmakologie an der Universität Köln. Band VI: Enthaltend Beiträge von O. Gessner und G. Barger. Paper. Price, 90 marks. Pp. 265, with 84 illustrations. Berlin: Julius Springer, 1938.**

In previous reviews of these supplements to Heffter's Handbuch, we have emphasized the importance of the work to research workers and to others who wish a complete survey of the drugs discussed. The present supplement contains but two subjects: (1) Tierische Gifte (Poisons of Animal Origin), by Professor Gessner of Halle, and (2) The Alkaloids of Ergot, by Professor Barger of Glasgow. The original article on Tierische Gifte was written by Professor Edwin Santon Faust in volume I [2], page 1748, published in 1924, and occupies 265 pages. The present supplement deals mainly with the developments since 1924 and occupies eighty-three pages. The references to the literature are extensive. The practicing physician will find this an interesting subject and will perhaps be amazed at the wide occurrence of poisonous substances in animals. He will find the known pharmacologic actions, and considerable chemistry that may aid him in practice, but no direct therapeutic uses or treatment. The original article on ergot in this handbuch (volume II [2], pp. 1297-1354) was written by the late Prof. Arthur Cushny in 1914 but was not published until 1924, without further revision. Thus a gap of two decades is now filled by Professor Barger. The present work is almost as large as the original, and since the best work on ergot has been done since the Cushny article was written, it is much more important. The original article was in German, the present is in English. Those acquainted with Professor Barger or his work know what to expect.

**Essentials of Obstetrical and Gynecological Pathology with Clinical Correlation. By Marion Douglass, M.D., F.A.C.S., Assistant Professor of Gynecology, Western Reserve University, Cleveland, Ohio, and Robert L. Faulhaber, M.D., Senior Clinical Instructor in Gynecology, Western Reserve University. Cloth. Price, $4.75. Pp. 187, with 148 illustrations. St. Louis: C. V. Mosby Company, 1938.**

This small monograph on the essentials of obstetric and gynecologic pathology was meant to fill a long standing need in modern American textbooks. To date there has been no volume limited to the pathology of obstetrics and gynecology, and many teachers have felt the necessity for just such a work. This book is well illustrated and simply written—in fact, one has the definite feeling that the authors have made the text too simple. True, they have set out to write a book for "the student beginning his acquaintance with the special pathology of this field and to the clinician who may want to review the essential histopathology of his specialty," but to a teacher of this subject to both students and interns the book seems inadequate. The text is meager and incomplete, there is no bibliography, and many topics have been omitted completely.

**Historia del protomedicato de Buenos Aires. Estado de los conocimientos sobre medicina en el Rio de la Plata, durante la época colonial. Los galenos españoles y los magos o curanderos indígenas. Antecedentes históricos y legales de la fundación del protomedicato y de la Escuela médica de Buenos Aires. Por Juan Ramon Beltran, profesor adjunto de medicina legal en la Facultad de ciencias médicas. Paper. Pp. 316. Buenos Aires: El Ateneo, 1937.**

The history of the protomedical center of Buenos Aires is of interest in relation to the development of medicine in Argentina. Dr. Beltrán's book on the subject is an exposé of printed or photographic authentic copies of historical documents which show the actual conditions of medicine in Argentina during the Spanish colonial period and its development up to the establishment of the University of Buenos Aires. Originally the protomedical center was the board of Spanish physicians who were in charge of the health and sanitary problems of the Spanish colonies, including teaching, examination and license of candidates to practice in the colonies. These problems in Argentina were under the control of the board of Lima. The protomedical board and center of Buenos Aires was established in 1778 by the viceroy Vertiz at the request of the Spanish physicians Miguel Gorman and Augustin Eusebio Fabre. It developed later on with the collaboration of Cosme Argerich, an Argentine-Spanish physician, into a small organized center for medical education with clinical and surgical departments and also a center for medical military services. The first school of medicine of Buenos Aires opened in 1800. It was under the supervision of the protomedical center. The latter disappeared in 1822 when the University of Buenos Aires was organized. Dr. Beltrán's book is interesting as it shows the development of medicine with the evolution of Argentina as an independent nation and also the example and self denial of physicians who fought for the advance of medicine for posterity.

**The Chemistry of the Sterids. By Harry Sobotka, Chemist to the Mount Sinai Hospital, New York. Cloth. Price, $3.50. Pp. 634. Baltimore: Williams & Wilkins Company, 1938.**

Chemical investigation has stimulated new formulations for the bile acids, sterols, the cardiac glycosides, sex hormones, and the antirachitic vitamins which have been recognized as phenanthrene derivatives, thereby increasing their numbers many fold in a short time. The author has developed an extensive list of the sterids, giving their physical and physiologic properties and discussing various analytic methods used in physiologic experimentation on the bile and sterols. The clinician will find valuable data in this comprehensive compilation of the bile acids and their related compounds. It is an excellent textbook for a reference library.

**A. M. A. Interns' Manual. Edited by the Council on Medical Education and Hospitals and the Council on Pharmacy and Chemistry of the American Medical Association. Fabrikoid. Price, 60 cents. Pp. 229. Chicago: American Medical Association, 1938.**

Every change made in this volume has been an improvement. Its size—an important feature to the overloaded intern—has been reduced, yet the information it offers has been materially increased. Besides an epitome of useful drugs and other forms of therapy usually administered by the intern, it also contains data on diets, toxicology and numerous practical hints. An important feature is that section concerning the intern's duties to the hospital and its personnel and what he in turn should expect from them. This vital part has been greatly neglected in the past. The hospital administration, the medical staff and the intern must realize that the so-called stipend, while desirable, can in no way compensate for certain elemental training at present denied to many interns. The intern is always a student, never a paid servant. Some of the faults of certain practitioners today certainly are traceable to defective internships. Hospital staffs and local medical societies might provide each intern with one of these valuable manuals and take a more active part in the welfare and guidance of the intern with wholly beneficial results to the medical profession.

# Bureau of Legal Medicine and Legislation

## MEDICOLEGAL ABSTRACTS

**Middle Ear Infection and Mastoiditis in Relation to Trauma.**—On Jan. 4, 1934, when a school bus operated by the defendant turned over, the plaintiff's son collided with or was thrown against a boy sitting opposite him in the bus. Within thirty minutes thereafter he complained of pain in the region back of his left ear. That evening he complained to his mother of a pain in the back of his neck and around his left ear. His mother applied "home remedies," using a liniment and hot towels, and continued to do so for the next two weeks. On January 20 a physician sent the boy to a hospital and on January 23 diagnosed the case as one of "a middle ear infection with a mastoid involvement." Notwithstanding a surgical operation, the boy died on February 14. The plaintiff, as administrator of the estate of his deceased son, brought this action against the driver of the bus. From a verdict in favor of the plaintiff, the defendant appealed to the Supreme Court of Iowa, alleging among other things that the trial court erred in overruling a motion for a directed verdict in the defendant's favor, because the plaintiff had not submitted evidence justifying the submission of the case to the jury.

At the trial, two expert medical witnesses for the plaintiff, in answer to hypothetical questions, testified that "an infection in the inner ear could or might result from trauma or a blow" and that "a bruise, without even a puncture or a rupture of the membrane itself, but just the bruise of the inner ear, that in itself could in time become sufficiently aggravated to go through this period of incubation and create an infection in the inner ear." The physician who attended the boy and who presumably performed the operation testified that in his judgment an injury was the probable cause of the mastoiditis which caused the boy's death. There was medical testimony that scarlet fever, which the boy had had some eight to ten years prior to the accident and from which he had recovered, could not have been the cause of the mastoiditis. Medical testimony for the defendant, however, was to the effect that trauma was not the cause of the boy's death.

The Supreme Court was of the opinion that the evidence presented was sufficient to warrant the trial court in submitting the case to the jury. The evidence showed that the plaintiff's son was physically fit prior to the accident but within thirty minutes thereafter he complained of a pain back of his left ear, that in the evening he complained to his mother of pain in the same region, and that from that time until his death he was treated by his mother or by physicians. In the opinion of the court the medical testimony eliminated all probable causes of mastoiditis other than trauma. Accordingly, the Supreme Court affirmed the judgment of the trial court in favor of the plaintiff. —*Olson v. Cushman (Iowa), 276 N. W. 777.*

**Workmen's Compensation Acts: Compensability of Death Due to Sepsis.**—Easton, in the course of his employment in the "scrub house" of the defendant's tannery, handled wet leather. His hands constantly came into contact with a tanning fluid that caused "cracks" on the fingers and hands of the workmen. After complaining while still at work of a "crack" on his left index finger for some weeks, he had to quit work, and after a few days treatment at home he was taken to a hospital. On admission, he had a high temperature and "a swollen condition of the left shoulder and axilla and a lump over his heart." Several weeks later he died. His widow brought proceedings under the workmen's compensation act of Pennsylvania against his employer. The workmen's compensation board awarded compensation on the ground that Easton had died "from a streptococcic infection of the blood stream . . . due to a septic poisoning which he contracted . . . through the sore or crack which he had on the index finger of his left hand, which he received in the handling of the wet hides." The employer apparently appealed to the court of common pleas, Potter County, and from a judgment of that court reversing the board's award the claimant appealed to the superior court of Pennsylvania.

The physician who attended Easton at the hospital testified in the course of the proceedings that when first examined he had a "crack" in his left index finger and blisters in the palm of his hand; that he had contracted an infection which entered the lymphatics of the palmar surface of the hand and traveled upward to the lymphatic glands of the armpit, where it "centralized," and that later the infection had entered his blood stream, as was demonstrated by examinations of the blood. In his opinion the absence of swelling of the hand and forearm was not significant, because evidence of infection is not always present at the site of entrance of the infecting bacteria. Another physician, who had attended the deceased prior to his admission to the hospital, testified that it is not always possible to determine the portal of entrance of the bacteria that later infect the blood stream. The superior court concluded that the evidence adduced did not support the board's finding that the infection had entered the blood stream of the deceased "through the sore or crack which he had on the index finger of his left hand."

Even assuming that there was testimony to support an inference that the infecting germ entered Easton's body through a "crack" on his finger, the entry of the germ, in the judgment of the court, was not brought about by an accidental injury occurring in the course of his employment. The evidence showed that the germ may have entered his body when he was absent from the premises of his employer and while engaged in activities having no connection with his employer's business. An "injury" or "personal injury" is defined by the workmen's compensation act to mean "only violence to the physical structure of the body, and such disease or infection as naturally results therefrom." In the instant case there was no abrupt or unforeseen external or internal "violence to the physical structure" of the deceased's body. There was no untoward or unexpected occurrence. The "sore or crack" on Easton's hand was a natural and usual incident of the kind of work in which he was engaged. This was a case of death from a germ disease which, whether it developed from germs within the body or from germs from without, was not due to an accidental injury and was not compensable.

Accordingly the superior court affirmed the judgment of the lower court reversing the workmen's compensation board's award of compensation.—*Easton v. Elk Tanning Co. (Pa.), 195 A. 648.*

**Workmen's Compensation Acts: Compensability of Paralysis Due to Cerebral Thrombosis.**—Custer, a master mechanic employed by the London Gold Mines Company, continued to work at an altitude of over 10,000 feet although he had been advised by a physician three months before that he should work at a lower altitude because he had a "secondary polycythemia." One evening, after walking up a steep grade for a distance of 350 feet in order to get to his office, he collapsed and became unconscious. Later he became totally disabled by paralysis of his right side, due to a thrombosis or a ruptured blood vessel in his brain. He brought proceedings under the workmen's compensation act against his employer and its insurance carrier, claiming that his paralysis was due to a ruptured blood vessel caused by his climb and the resulting exhaustion. The industrial commission, however, denied compensation on the ground that the claimant's paralysis was due to a cerebral thrombosis resulting from "secondary polycythemia" and not the result of an accident or external injury. From a judgment of a district court, to which an appeal had been taken, reversing the award of the industrial commission, the employer, the insurance carrier and the commission appealed to the Supreme Court of Colorado.

The medical testimony presented before the commission was to the effect that the claimant's paralysis was not due to his employment and would have occurred regardless of what he was doing at the time. One medical witness testified that, regardless of whether a rupture or a thrombosis of a cerebral blood vessel had occurred, there was no connection between

such an occurrence and an industrial accident. Two medical witnesses were of the opinion that the paralysis was due to a cerebral thrombosis. One of these witnesses, who was of the opinion that thrombosis of the left internal carotid artery had occurred as the result of physical illness and not the result of an accident, in answer to a question as to whether exertion might have accelerated the attack, testified: "If it is a hemorrhage of the brain I think it is possible, yes; if thrombosis I would say, no."

While there was some evidence, said the Supreme Court, from which the commission might have found that the paralysis was due to a rupture of a cerebral blood vessel primarily caused by overexertion, such a finding would have been contrary to the preponderance of the evidence. The court concluded, therefore, that the commission's finding that the paralysis was due to a cerebral thrombosis, with no industrial connection, was amply supported by the evidence. Accordingly, the Supreme Court reversed the judgment and remanded the cause to the lower court with directions that the commission's order disallowing compensation be affirmed.—*London Gold Mines Co. et al. v. Custer (Colo.), 74 P. (2d) 679.*

**Medical Practice Acts: Chiropractor May Neither Practice Physical Therapy Nor Prescribe Diets.**—The defendant, a licensed chiropractor in Iowa, held himself out, including the using of newspaper and telephone directory advertising, as practicing physiotherapy, electrotherapy, and colonic irrigation, and as prescribing diets. In some advertisements he designated himself as being a chiropractor and physiotherapist. Contending that these practices constituted the practice of medicine, not the practice of chiropractic, the state instituted proceedings to enjoin the defendant from continuing such methods of treatment. The district court issued the injunction but provided that the decree should not enjoin the defendant "from using his reasonable judgment in recommending to a patient certain changes of diet, exercise or such of his general habits as affect his health." From this portion of the decree the state appealed to the Supreme Court of Iowa, claiming with respect thereto that the prescribing of diets should have been wholly enjoined. The defendant chiropractor appealed from the decree as a whole.

The practice of chiropractic in Iowa is defined by statute as "the adjustment by hand of the articulations of the spine or by other incidental adjustments." In this act, said the court, is found the only source of the defendant's authority to treat human ailments. When he professed to use and used modalities other than those authorized, as curative means or methods, he attempted to function outside of the restricted field of endeavor to which the legislature limited his practice. The defendant contended that another section of the chiropractic act, section 2559, authorized, by inference, the type of practice in which he was engaged by providing that a license to practice chiropractic shall not authorize the licentiate to practice operative surgery or osteopathy, or to administer or prescribe any drug or medicines included in materia medica. Relying on the maxim "*expressio unius est exclusio alterius*," or the mention of one is the exclusion of another, he urged that because the thing prohibited in this section is the administering or prescribing any drug or medicine included in materia medica, a legislative intent was shown to authorize chiropractors to use medicine in the broad general definition of a remedial agent or remedy. He pointed to the fact that the section did not add the words "vibrator," "traction tables," "ultraviolet rays," "infra red lamps," "galvanic current," to the prohibitory words used therein and that it was obvious that the words could not be added except by the legislature. With this contention, the court expressed disagreement. The legislature intended, the court thought, to limit chiropractors in their treatment to the adjustment by hand of the articulations of the spine or by other incidental adjustments, and that section 2559 did nothing more than to emphasize the prohibition as to materia medica.

The Supreme Court approved the decree of the trial court restraining the defendant from professing to treat and treating human ailments in modes and manners outside the field of chiropractic but held that the decree should have also enjoined him wholly from the prescribing for or the advising of his patients with respect to diet. The trial court was directed to revise the decree accordingly.—*State v. Boston (Iowa), 278 N. W. 291.*

**Workmen's Compensation Acts: Use of Corrective Lenses in Relation to Evaluation of Loss of Vision.**—Elder, who had a total loss of vision in his left eye, injured his right eye in the course of his employment. He brought proceedings under the workmen's compensation act against his employer and its insurance carrier and was awarded compensation by the industrial commission for total industrial blindness. From a judgment by a district court, to which an appeal had been taken, sustaining that award, the employer and its insurance carrier appealed to the Supreme Court of Colorado.

The appellants claimed that the commission and the district court erred in failing to evaluate the claimant's vision with the correction obtainable by the use of lenses. The Supreme Court admitted that the authorities were in conflict as to whether corrective lenses should be used in the evaluation of loss of vision. In *Masoner* v. *Wilson & Co.*, 141 Kan. 882, 44 P. (2d) 265, it was held that the extent of loss of vision should be calculated irrespective of what it would scientifically be rated by applying corrective lenses. On the contrary, in *Kelley* v. *Prouty*, 54 Idaho 225, 30 P. (2d) 769, it was held that improvement by the use of corrective lenses must be considered in evaluating loss of vision. The Supreme Court, however, refused to undertake to reconcile these two views or to determine whether a sounder view lay somewhere between them. It decided only that the record in the case before it did not justify a rejection of the commission's finding that the claimant was industrially blind in his right eye and that he had a total loss of vision in his left eye prior to the accident. The court pointed out specifically that it did not say that there might not be a state of facts that would make correction with lenses an important factor in determining whether, under those facts, the reduction of loss of vision by the use of corrective lenses would be sufficient to remove the case from the class of total industrial loss. In the present case, however, the court concluded that it would not be in accord with the liberal nature of the workmen's compensation act to presume, in the absence of evidence so showing, that the use of corrective lenses would render the claimant partially efficient as an industrial worker, when without the use of such lenses he would be a total industrial loss.

Accordingly, the Supreme Court affirmed the judgment of the lower court affirming the commission's award.—*Platt-Rogers, Inc., et al. v. Industrial Commission et al. (Colo.), 74 P. (2d) 673.*

## Society Proceedings

### COMING MEETINGS

Academy of Physical Medicine, Washington, D. C., Oct. 24-26. Dr. Herman A. Osgood, 144 Commonwealth Ave., Boston, Secretary.

American Public Health Association, Kansas City, Mo., Oct. 25-28. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.

American Society of Tropical Medicine, Oklahoma City, Nov. 15-18. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.

Association of American Medical Colleges, Syracuse, N. Y., Oct. 24-26. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.

Central Society for Clinical Research, Chicago, Nov. 4-5. Dr. Lawrence D. Thompson, 4932 Maryland Ave., St. Louis, Secretary.

International Society of Medical Health Officers, Kansas City, Mo., October 24. Dr. Leon Banov, County Health Department, Charleston, S. C., Secretary.

Inter-State Postgraduate Medical Association of North America, Philadelphia, Oct. 31-Nov. 4. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.

Omaha Mid-West Clinical Society, Omaha, Oct. 24-28. Dr. J. D. McCarthy, 107 South 17th St., Omaha, Secretary.

Pacific Coast Society of Obstetrics and Gynecology, Los Angeles, Nov. 30-Dec. 3. Dr. T. Floyd Bell, 400 29th St., Oakland, Calif., Secretary.

Radiological Society of North America, Pittsburgh, Nov. 28-Dec. 2. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.

Southern Medical Association, Oklahoma City, Nov. 15-18. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.

Southern Surgical Association, White Sulphur Springs, W. Va., Dec. 6-8. Dr. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.

Southwestern Medical Association, El Paso, Texas, Oct. 27-29. Dr. Orville E. Egbert, First National Bank Bldg., El Paso, Texas, Secretary.

Western Surgical Association, Omaha, Dec. 5-8. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

# Current Medical Literature

## AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

### American Journal of Medical Sciences, Philadelphia

196: 305-460 (Sept.) 1938

Late Results in Treatment of Amebic Abscess and Hepatitis of the Liver. P. W. Brown and C. H. Hodgson, Rochester, Minn.—p. 305.
*The "Hematopoietic Principle" in the Diseased Human Liver. L. Schiff, M. L. Rich and S. D. Simon, Cincinnati.—p. 313.
Consideration of Phenomenon of Purpura Following Scarlet Fever. M. J. Fox and N. Enzer, Milwaukee.—p. 321.
Chronic Leukemia: Study of Incidence and Factors Influencing Duration of Life. B. S. Leavell, New York.—p. 329.
Failure of Electromagnetically Induced Heat to Increase Renal Efficiency. E. Blatt, P. J. Fouts and I. H. Page, Indianapolis.—p. 340.
*Chemotherapy of Types VII and III Pneumococcus Infections with Sulfanilamide, 4,4'-Di-(Acetylamino)-Diphenylsulfone and 4,4'-Diaminobenzenesulfonanilide. F. B. Cooper, P. Gross and M. Lewis, Pittsburgh.—p. 343.
Studies on Liver Function in Pneumococcic Pneumonia. T. J. Curphey, Garden City, N. Y., and S. Solomon, New York.—p. 348.
Note on Rapid Desensitization in Case of Hypersensitiveness to Insulin. A. C. Corcoran, Indianapolis.—p. 359.
Semen Analyses of 200 Fertile Men. R. S. Hotchkiss, E. K. Brunner and P. Grenley, New York.—p. 362.
Vitamin C in the Spinal Fluid. H. Wortis, J. Lichmann and S. B. Wortis, New York.—p. 384.
Note on Lack of Correlation of Capillary Fragility with Vitamin C Content of Blood, Spinal Fluid and Urine. J. Liebmann, H. Wortis and Ethel Wortis, New York.—p. 388.
Note on Lack of Hemoregulatory Effect of Ascorbic Acid on Patients with Polycythemia Vera. E. V. Kandel and G. V. LeRoy, Chicago.—p. 392.
Relief of Anginoid Pain Following Removal of Intrathoracic Nontoxic Nodular Goiter. J. Edeiken and E. Rose, Philadelphia.—p. 395.
Isolated Calcified Aortic Stenosis, with Particular Reference to Its Etiology and Differential Diagnosis. W. F. Friedewald, St. Louis, and A. R. Ewing, Philadelphia.—p. 400.
Varieties of Single Coronary Artery in Man, Occurring as Isolated Cardiac Anomalies. E. B. Krumbhaar and W. E. Ehrich, Philadelphia.—p. 407.
*Anemia of Alcohol Addicts: Observations as to Role of Liver Disease, Achlorhydria, Nutritional Factors and Alcohol on Its Production. A. Bianco and N. Jolliffe, New York.—p. 414.
Convulsive (Pentamethylenetetrasol) Shock Therapy in Depressive Psychoses: Preliminary Report of Results Obtained in Ten Cases. A. E. Bennett, Omaha.—p. 420.

**"Hematopoietic Principle" in Diseased Human Liver.**—Schiff and his associates sought additional data on the presence (or absence) of the antianemic substance in the diseased human liver. The patients selected for injection had typical pernicious anemia with a red cell count between 1 and 3 million per cubic millimeter, had received no antianemic treatment in the form of liver, iron, arsenic or transfusions for at least one month prior to the injection, were free of infection (with one exception) and subsequently showed a complete remission under specific treatment. Before extracts of human livers were prepared, a control extract was made from a normal calf's liver and administered intramuscularly to a patient with pernicious anemia. A satisfactory response was obtained. Extracts were then prepared from the livers of five patients with hepatic disease. The extracts were then administered intramuscularly to the patients with pernicious anemia in relapse. A characteristic reticulocytosis resulted, followed by an increase in hemoglobin and red cell count and by definite clinical improvement. The three patients with cirrhosis presented a macrocytic anemia, while the type of anemia in the remaining two patients was not definitely determined. The conclusion is that the human liver may contain the specific hemopoietic principle even when it is the seat of extensive and protracted disease. This holds true even in the presence of macrocytic anemia and strongly suggests that the macrocytic anemia associated with hepatic disease is not caused by failure of the liver to store the specific antianemic substance.

**Pneumococcic Infections and Sulfanilamide.**—Cooper and his colleagues found 4,4'-di-(acetylamino)-diphenylsulfone less effective than sulfanilamide against pneumococcic infections in mice caused by type VII and III strains, as well as in pneumococcic pneumonia in rats caused by the type III strain. The results reported, although at variance with those of other investigators, probably find explanation in differences of strain susceptibility to chemotherapy. Although 4,4'-diaminobenzenesulfonanilide was at times more effective than sulfanilamide against the particular pneumococcus strains tested, it appears to be too toxic to warrant clinical trial. To the infections caused by types I, II, III and XIV pneumococci which have previously been found susceptible to therapy by certain sulfonamide and sulfone compounds may be added those caused by the type VII pneumococcus. These experiments verify previous chemotherapeutic results in pneumococcic infections, namely that little or no protection in mice may be demonstrated against more than 100 fatal doses, whereas good protection has been repeatedly reported against ten fatal doses.

**Anemia of Alcohol Addicts.**—Bianco and Jolliffe carried out quantitative studies of the erythrocytes in 184 instances of addiction to alcohol. Of these subjects, 159 in addition to alcoholism had one or more of the following diseases: polyneuritis, pellagra, "alcoholic" stomatitis, "alcoholic" encephalopathy or cirrhosis of the liver. Quantitative anemia did not occur in the "uncomplicated" group of twenty-five subjects but was present in 61 per cent of the "complicated" group. Macrocytosis was present in about 50 per cent of both groups. Macrocytic anemia in these addicts to alcohol was not limited to subjects manifesting pellagra or cirrhosis of the liver but occurred as well, and in about the same frequency, in subjects having polyneuritis, "alcoholic" stomatitis and "alcoholic" encephalopathy. There was no correlation between the frequency of macrocytosis and achlorhydria, severity of hepatic damage or the presence of an enlarged liver. The macrocytosis of the addict to alcohol is not regarded as a manifestation of inability on the part of the liver to store a hemopoietic principle but as an extrinsic deficiency of some necessary hemopoietic substance required to maintain normocytosis.

### American Journal of Public Health, New York

28: 1029-1152 (Sept.) 1938

Health Hazards in the Dry Cleaning Industry: Preliminary Report of Survey of Dry Cleaning Establishments in the Detroit Metropolitan Area. W. H. Cary Jr., Detroit, and J. M. Hepler, Lansing, Mich.—p. 1029.
Methods of Estimating Postcensal Populations. H. S. Shryock Jr., Princeton, N. J.—p. 1042.
Handicaps in the Normal Growth and Development of Rural Negro Children. H. A. Poinderxter, Washington, D. C.—p. 1048.
Critical Discussion of Some Methods and Standards for Certified Milk. J. H. Brown, Baltimore.—p. 1053.
More Effective School Health Program. J. T. Phair, Toronto.—p. 1059.
Cultural Methods for Detection of Typhoid Carriers. Elizabeth J. Cope and J. A. Kasper, Detroit.—p. 1065.
Present Status of Vitamin Milks. E. V. McCollum, Baltimore.—p. 1069.
Postgraduate Education of Physicians in Pediatrics. M. E. Wegman, Baltimore.—p. 1072.
What Every Health Officer Should Know: Vital Statistics. Jessamine S. Whitney, New York.—p. 1077.
Id.: Industrial Hygiene. L. D. Bristol, New York.—p. 1080.
Id.: Health Education. Mary P. Connolly, Detroit.—p. 1083.
Id.: Public Health Nursing. Naomi Deutsch, Washington, D. C.—p. 1087.
Federal Facilities to Expedite Emergency Sanitation Measures. R. E. Tarbett, Washington, D. C.—p. 1091.
*Scarlet Fever Control. E. R. Krumbiegel, Milwaukee.—p. 1096.

**Scarlet Fever Control.**—Krumbiegel states that on March 12, 1934, the Milwaukee health department adopted the procedure of the Scarlet Fever Committee for Dick testing persons more than 18 months of age, and the subsequent immunization of those showing a positive reaction. In 1934 15,642 Dick tests were given, of which 10,500 were positive. Among these Dick positive reactors 1,769 received no toxin for immunization, while 6,497 received in 1934 either a standard five dose course or as many doses as they elected to receive. None of these subsequently received any artificial immunization. The fifth dose of toxin was received by 3,914 persons, of whom 3,532 were retested and appeared for reading. Of these, 240 were positive and 183 received a sixth dose of toxin. All cases have been followed through March 12, 1937. During

the three years the case rate for scarlet fever was more than fourteen times higher in the unimmunized Dick positive reactors than in those who completed the standard five dose course of toxin. During the three years the immunity derived from four doses of toxin was as effective as that from five doses. The case rates for scarlet fever were lower in primarily negative Dick reactors and positive reactors who completed the standard five dose course of toxin than for those who previously had an attack of scarlet fever. During the three years the practical value of retesting has proved negligible. A culture filtrate free of, or as near as possible free of, endotoxin is desirable, at least for the purpose of cutaneous testing.

## Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

22: 537-668 (Sept.) 1938

Present Status of Epidemiology of Gonorrhea. R. A. Vonderlehr and Lida J. Usilton, Washington, D. C.—p. 537.
Prenatal Syphilis in One of Twins: Case Report. U. J. Wile and D. G. Welton, Ann Arbor, Mich.—p. 544.
Clinical Excretion of Bismuth: VII. Autopsy Distribution of Bismuth in Patients After Clinical Bismuth Treatment. T. Sollmann, H. N. Cole and Katharine Henderson, with collaboration of G. W. Binkley, H. Connors, H. Reichle and D. Seecof, Cleveland.—p. 555.
Sources of Infection in Syphilis. G. V. Kulchar and Erla I. Nimnis, San Francisco.—p. 584.
Yearly Admissions of Four Genito-Infectious Diseases at Cleveland City Hospital, with Special Reference to Syphilis. G. W. Binkley, Cleveland, and E. A. Levin, San Francisco.—p. 588.
Prevention and Treatment of Neurosyphilis by Combined Artificial Fever and Chemotherapy: Report of Results in Seventy-Two Cases of Asymptomatic and Clinical Neurosyphilis. A. E. Bennett and M. D. Lewis, Omaha.—p. 593.
*Acquired Syphilis of Infancy and Childhood: Report of Thirty-Five Cases. J. R. Waugh, Norfolk, Va.—p. 607.
Syphilis Control in a Chemical Industry. G. H. Gehrmann, Wilmington, Del.—p. 623.
Erythema of Vulva Simulating Condyloma Latum. H. M. Robinson, Baltimore.—p. 631.
Chancroidal Infection in the Female. R. Torpin and R. B. Dienst, Augusta, Ga.—p. 634.
*Intravenous Aldarsone in Treatment of Neurosyphilis. G. R. Kamman, St. Paul.—p. 638.

**Acquired Syphilis of Infancy and Childhood.**—Waugh examined thirty-five infants and children with acquired syphilis, not prenatal syphilis, over a period of six years during which time there were admitted to the same service 183 cases of prenatal syphilis and 20,567 adult cases. Since the number of infants and children with syphilis admitted to this clinic is small compared to the number of adults, it would appear that the incidence of acquired syphilis of infancy and childhood may be considerably greater than generally recognized. Twenty-two children were between the ages of 5 months and 10 years, and two were 11 years of age. Only two of these infants (Negroes) acquired syphilis through definite sexual contact with other children or each other. Another white girl may have acquired her infection through sexual contact, although this was denied, since she had a genital chancre. Her mother also had syphilis. The source of infection in the case of the twenty-one other children was undoubtedly a parent, brother or sister. The other eleven children who were from 12 to 14 years of age acquired syphilis definitely through sexual intercourse. Two of these children (female) were married. All of these children were sexual delinquents except one of the two married girls. The manifestations of acquired syphilis in infants and children are the same as those in the adult. Fournier states that the primary adenopathy is less marked than in the adult. Severe anemia may accompany the secondary manifestations. Later sequelae have been severe and tertiary lesions have been common, caused probably by insufficient treatment. Arsphenamine, neoarsphenamine and bismuth compounds were used intensively in the treatment of these infants and children, exactly as in the case of acquired syphilis in adults, except that the dosages were graduated according to age and weight. They tolerated antisyphilitic treatment better than adults, there being no severe reactions and few mild reactions. The lesions disappeared and the children responded in every way as well as adults.

**Intravenous Aldarsone in Neurosyphilis.**—Kamman gave fifty-three patients with neurosyphilis 1,495 injections of the formaldehyde sulfoxylate of 3-amino-4-hydroxyl-phenylarsonic acid (aldarsone). The drug is dissolved in 10 cc. of sterile distilled water and a beginning dose of 0.25 Gm. is given intravenously. It is then given at weekly intervals, the dose being raised to 0.5 Gm. the second week and to 1 Gm. the third week. Unless contraindicatory symptoms appear, twenty-four weekly injections are given, further treatment being determined by the clinical and serologic response. Forty of the fifty-three patients had received previous treatment with varying results. Clinically eleven of these patients had not improved under previous treatment but improved under aldarsone, eleven improved under previous treatment but did not show any further improvement under aldarsone, twelve improved under previous treatment and showed further improvement on aldarsone, five did not improve on previous treatment or on aldarsone, and four asymptomatic patients did not show clinical signs but there was definite serologic improvement. Serologically, thirteen patients did not improve on previous treatment but showed improvement on aldarsone, ten improved on previous treatment but did not improve further on aldarsone, ten improved under previous treatment and improved further on aldarsone, and five did not improve under either treatment. The serologic results in two patients are unknown. In four patients with tabes dorsalis the serologic and clinical improvement was accomplished by aldarsone alone. Toxic reactions definitely due to aldarsone were encountered in only three patients, and in only one patient was treatment discontinued because of toxic reactions. In no patient was it necessary to suspend treatment because of changes in the visual fields or in the optic disks. In three patients originally contracted fields enlarged under aldarsone, and in two others the contraction of the fields increased somewhat under aldarsone.

## American Review of Tuberculosis, New York

38: 277-398 (Sept.) 1938

*Results of Artificial Pneumothorax: Review of 530 Cases. G. F. Aycock and P. E. Keller, Denver.—p. 277.
Lobectomy and Thoracoplasty in the Same Patient: Report of Three Cases. R. H. Overholt and R. H. Betts, Brookline, Mass.—p. 292.
Healing of Experimental Pulmonary Tuberculosis by Fascial Transplantation and Bronchial Ligation. L. Escudero and W. E. Adams, Chicago.—p. 298.
Disease of Accessory Nasal Sinuses: Its Incidence in a Tuberculosis Sanatorium. B. L. Brock, Waverly Hills, Ky., and J. C. Bell, Louisville, Ky.—p. 312.
Bronchial Occlusion Due to Tuberculous Lymphadenitis. L. V. Schneider, Glenn Dale, Md.—p. 320.
Anemia as a Predisposing Factor in Tuberculosis. Cecilia Shiskin and S. R. Gloyne, Victoria Park, England.—p. 325.
Pathogenesis of Tuberculosis in Children. H. S. Willis, Northville, England.—p. 336.
Influence of Silica on Natural and Acquired Resistance to Tubercle Bacillus. A. J. Vorwald and A. B. Delahant, Saranac Lake, N. Y.—p. 347.
Pathology of the Silicotic Nodule. J. Walsh, Philadelphia.—p. 363.
Sedimentation Rate of Red Blood Cells in Plasma, Pleural and Ascitic Fluids. S. Cohen, P. Farzei and B. S. Pollak, Jersey City, N. J.—p. 372.
*Prontosil in Experimental Tuberculosis: Preliminary Report. H. F. Dietrich, Beverly Hills, Calif.—p. 388.
Influences of Mycotes on Tubercle Bacilli: Preliminary Report. D. Bargłowski, Pueblo, Calif.—p. 393.

**Results of Artificial Pneumothorax.**—Aycock and Keller analyze the results of 530 cases of artificial pneumothorax essentially on the basis of the reactions of the dominant tissue at the time artificial pneumothorax was induced in each case. These reactions were considered under three general groups, exudative, caseous pneumonic and fibrocavernous. Satisfactory results were obtained in 301 cases. In the exudative group alone there were 250 cases; satisfactory results were obtained in 73.5 per cent. The incidence of important complications, such as pleural exudate and superimposed spontaneous pneumothorax, was highest in the fibrocavernous group. The high percentage of satisfactory results from artificial pneumothorax in the exudative cases simply means that this is the optimal phase in which to apply this form of therapy. In this phase the mechanical barriers resulting from the fibrosis incident to healing and tissue replacement have not become dominant. Accordingly, satisfactory collapse is obtained more readily. On the other hand, the fibrocavernous group comprises cases in the healing or reparative phase. Fibrosis has become the dominant tissue reaction and as a result certain mechanical barriers have been formed, which threaten the successful issue of artificial pneumothorax. The caseous pneumonic group represents cases in a

sort of intensified exudative phase. The number of such cases reviewed is too small to serve as a basis for definite conclusions as to the results of collapse therapy.

**Prontosil in Experimental Tuberculosis.**—Dietrich chose the disodium salt of 4-sulfamido-phenyl-2'-azo-7'-acetylamino-1'-hydroxynaphthalene-3',6'-disulfonic acid (prontosil) in a 2.5 per cent solution for its effect on experimental tuberculosis in the guinea pig. Six animals were given 0.5 cc. of a suspension of tubercle bacilli recovered from the lung of a patient dying of tuberculosis and four were injected with 0.25 cc. of the suspension. All inoculations were made subcutaneously just cephalad to the right groin. The prontosil administered was injected into the peritoneal cavity in single daily doses of 100 mg. per kilogram of body weight. No animal showed any peritoneal reaction to the injected prontosil. Treated animals died much sooner than did the untreated controls. The pathology of tuberculosis offers an excellent reason why, even if one possessed an agent strongly bactericidal for the tubercle bacillus in vitro, the bacilli might be unaffected in experimental and clinical infections. Prontosil did not inhibit the growth or spread of tubercle bacilli, even though it came in contact (by prontosil being given before inoculation with tubercle bacilli) with them before they were fixed in the tissues.

## Archives of Neurology and Psychiatry, Chicago

40: 417-638 (Sept.) 1938

Cerebral Cortex in Man: I. Cerebral Cortex and Consciousness. W. Penfield, Montreal.—p. 417.
Sweat Secretion in Man: IV. Sweat Secretion of the Face and Its Disturbances. C. F. List and M. M. Peet, Ann Arbor, Mich.—p. 443.
Quantitative Olfactory Tests: Value in Localization and Diagnosis of Tumors of the Brain, with Analysis of Results in 300 Patients. C. A. Elsberg and Jane Stewart, New York.—p. 471.
Margins of Optically Excitable Cortex in the Rabbit. J. L. O'Leary and G. H. Bishop, St. Louis.—p. 482.
Effect of Lesions in Vestibular Part of Cerebellum in Primates. R. S. Dow, New Haven, Conn.—p. 500.
Acute Amaurotic Epilepsy in Macacus Rhesus. L. van Bogaert and H. J. Scherer, Antwerp, Belgium.—p. 521.
Negation or Reversal of Legal Testimony. M. H. Erickson, Eloise, Mich.—p. 548.
Dermoid of Spinal Cord: Report of Case in Which There Was Removal with Improvement. C. B. Mason, New York.—p. 554.
Modifications in Technic for Use of Horsley-Clarke Stereotaxic Instrument. F. Harrison, Chicago.—p. 563.

## Archives of Pathology, Chicago

26: 603-764 (Sept.) 1938

Giant Follicular Lymphadenopathy With or Without Splenomegaly: Its Transformation into Polymorphous Cell Sarcoma of the Lymph Follicles and Its Association with Hodgkin's Disease, Lymphatic Leukemia and an Apparently Unique Disease of the Lymph Nodes and Spleen—a Disease Entity Believed Heretofore Undescribed. D. Symmers, New York.—p. 603.
*Histology of Bone Marrow in Aplastic Anemia. C. P. Rhoads and D. K. Miller, New York.—p. 648.
Incidence of Mild Degrees of Atrophy in Fasciculus Gracilis. D. Duncan, Galveston, Texas.—p. 664.
Systemic Proliferation of Reticulo-Endothelial System (Reticulo-Endotheliosis): Report of Case and Comments on the Literature. M. S. Sachs, Baltimore.—p. 676.
Attraction of Human Polymorphonuclear Leukocytes by Tuberculoprotein. W. B. Wartman, Cleveland.—p. 694.
Metchnikoff's Contribution to Pathology. B. M. Fried, New York.—p. 700.

**Bone Marrow in Anemia.**—Rhoads and Miller studied the living cells of the sternal marrow by the supravital technic of Sabin in forty-one cases of aplastic anemia. On the basis of the histologic changes observed in the stained preparations, it is possible to divide the cases into five general groups: aplastic anemias with aplastic, hyperplastic (pluricytopenia), active, megakaryocytic or sclerotic marrows. The basic change common to the aplastic, active and hyperplastic subgroups was a failure of maturation of the hemopoietic cells at an early, undifferentiated stage. Comparison of marrow from persons presenting aplastic anemia with marrows from persons presenting acute agranulocytosis shows in the latter a similar lack of maturation and suggests that aplastic anemia and acute agranulocytosis may have some etiologic factor in common. Although a defect in maturation is present in the megakaryocytic group, the major change is a replacement of hemopoietic marrow by a cellular structure made up of megakaryocytes and their precursors. The sclerotic group is characterized by an elongation and matting together of the marrow cells.

## Archives of Surgery, Chicago

37: 353-520 (Sept.) 1938

*Fantom Limb Pain: Report of Ten Cases in Which It Was Treated by Injections of Procaine Hydrochloride Near Thoracic Sympathetic Ganglions. W. K. Livingston, Portland, Ore.—p. 353.
Osteomyelitis of the Pelvic Girdle. A. O. Wilensky, New York.—p. 371.
Studies of Hepatic Function by Quick Hippuric Acid Test: I. Biliary and Hepatic Disease. F. F. Boyce and Elizabeth M. McFetridge, New Orleans.—p. 401.
Id.: II. Thyroid Disease. F. F. Boyce and Elizabeth M. McFetridge, New Orleans.—p. 427.
Id.: III. Various Surgical States. F. F. Boyce and Elizabeth M. McFetridge, New Orleans.—p. 443.
*Treatment of Intractable Bronchial Asthma by Bilateral Resection of Posterior Pulmonary Plexus. W. F. Rienhoff Jr. and L. N. Gay, Baltimore.—p. 456.
Behavior of Joint Cartilage in Late Rickets: Contribution to Question of Atrophy of Cartilage. E. Freund, Los Angeles.—p. 470.
Treatment of Postoperative Parathyroid Insufficiency with Dissolved Calcium Lactate. S. J. Wilson, Columbus, Ohio.—p. 490.
Mechanical Intestinal Obstruction Complicating Pelvic Inflammatory Disease. M. H. Levine and G. Blinick, New York.—p. 498.
Tuberculosis of the Stomach. O. T. Clagett and W. Walters, Rochester, Minn.—p. 505.

**Fantom Limb Pain.**—In his capacity as medical examiner for the state industrial accident commission of Oregon, Livingston has examined a number of men who have had an upper extremity amputated. The proportion of these who feel pain in the fantom limb is surprisingly high, and the similarity in their complaints is so striking as to warrant the term "fantom limb pain syndrome." Ten cases are reported. In all of these the patients have had one or more injections of procaine hydrochloride near the thoracic sympathetic ganglions of the affected side. Eight patients felt immediate relief from pain, together with an extraordinary sequence of subjective and objective changes. In four of these the relief was of sufficient degree and duration to suggest that injection of procaine hydrochloride is of therapeutic value. The pain syndrome and its implications in relation to the general problem of pain are discussed.

**Resection of Posterior Pulmonary Plexus in Asthma.**—The rationale of the procedure of bilateral resection of the posterior pulmonary plexus is based on the anatomic fact that only at this point can the extrinsic nerve supply of the lung be completely interrupted. By resection of this plexus it is therefore possible to isolate the entire organ from any influence brought to bear on the lung through its extrinsic nerve supply. The selection of patients for this method of treatment depends on the severity and frequency of the asthmatic seizures. The eleven patients that Rienhoff and Gay chose for the treatment were repeatedly in an asthmatic condition before operation and were consequently economically and socially incapacitated. The first patient was operated on in March 1934 and the last in March 1936. Five additional patients have been operated on since March 1936, three of whom at the time of writing have remained completely well for one year and two of whom remain improved after a shorter period. Deaths which could be attributed to the operative procedure have not occurred. Convalescence has been uneventful, with one exception: the patient, an elderly Negro, died several weeks after the second stage of the operation had been completed. The patient had suffered for years from asthmatic seizures associated with a high degree of arteriosclerosis, hypertension and some chronic myocardial change. Of the ten patients discharged from the hospital, one was entirely unimproved; one improved for three months, finally dying of what seemed to be cardiac failure; four are completely well at the time of writing, having been free of attacks since operation or a short time later, and have been able to resume their former work, and four have occasional mild attacks of asthma, all of which are controlled by small doses of ephedrine.

## Bulletin New York Academy of Medicine, New York

14: 521-582 (Sept.) 1938

Experimental Hypertension Induced by Renal Ischemia (Harvey Lecture, May 19, 1938). H. Goldblatt, Cleveland.—p. 523.
Endoscopic Prostatic Resection. J. F. McCarthy, New York.—p. 554.
*Specific Prevention of Diphtheria: Further Observations and Inquiries. J. G. FitzGerald, D. T. Fraser, N. E. McKinnon and M. A. Ross, Toronto.—p. 566.

**Specific Prevention of Diphtheria.**—FitzGerald and his colleagues state that prior to the use of toxoid there was no effectual control of diphtheria in Canada. In spite of the free distribution of antitoxin for prevention as well as for treatment,

recorded diphtheria morbidity persisted at its previous high levels and the mortality, though falling, still presented one of the most important public health problems. The reaction test, as devised by Moloney, practically obviated the hazard of reactions and thus facilitated the wide use of toxoid. Requirements for the Schick test are in need of revision and standardization. It is not infallible and its limitations should be recognized. Titrations of the blood serum of children who initially had no antitoxin and were then submitted to various immunization procedures show that three doses of unmodified diphtheria toxoid induced a higher antitoxin response than any of the other procedures compared (two doses of unmodified diphtheria toxoid, one dose of alum precipitated toxoid and two doses of alum precipitated toxoid). Titrations of blood serum of vaccinated children indicate a loss in antitoxin as time passes. Field studies show that the reduction in diphtheria, in those vaccinated with two doses of toxoid is, like the antitoxin response, less than the reduction in those vaccinated with three doses, and that the diphtheria occurring in the latter group is reduced by approximately 90 per cent as compared with that found in schoolmates under the same exposure. Records show striking declines in diphtheria morbidity and mortality and in the incidence of carriers in various cities and provinces in Canada following the wide use of toxoid, leaving no doubt that the decline is due to immunization. The extent of the decline in several of the large cities and in certain of the provinces of Canada shows indubitably that diphtheria is a preventable disease.

## Connecticut State Medical Society Journal, Hartford

**2: 423-476 (Sept.) 1938**

Submarine Escape Training. A. S. Chrisman, New London.—p. 423.
Physicians and Lawyers. G. H. Cohen, Hartford.—p. 431.
Syphilis of the Central Nervous System. G. A. Gosselin, Hartford.—p. 435.
The Preschool Age: The Stepchild in Preventive Medicine. S. A. Rose, Stamford.—p. 439.
Surgical Treatment of Peptic Ulcer. T. J. Sullivan, New Haven.—p. 441.
Connecticut Obstetric Consulting Service. J. H. Howard, Bridgeport.—p. 443.

## Endocrinology, Los Angeles

**22: 121-262 (Aug.) 1938**

*Effect of Testosterone Propionate on Genitalia, Prostate, Secondary Sex Characters and Body Weight in Eunuchoidism. A. T. Kenyon, Chicago.—p. 121.
Effect of Testosterone Propionate on Nitrogen, Electrolyte, Water and Energy Metabolism in Eunuchoidism. A. T. Kenyon, Irene Sandiford, A. H. Bryan, Kathryn Knowlton and F. C. Koch, Chicago.—p. 135.
Effect of Gonadotropic Hormones on Persisting Corpora Lutea in Hypophysectomized Rats. R. O. Greep, Cambridge, Mass.—p. 154.
Gonadotropic Action of Normal Male Urine Extract on Dog. J. H. Leathem and J. A. Morrell, Princeton and New Brunswick, N. J.—p. 164.
Effect of Castrate Urine Hormone on Testis. H. S. Rubinstein, Baltimore.—p. 171.
Adiposity and Diabetes Mellitus in a Monkey with Hypothalamic Lesions. S. W. Ranson, C. Fisher and W. R. Ingram, Chicago.—p. 175.
Miscellaneous Experiments on Estrogen-Progesterone Induction of Heat in Spayed Guinea Pig. J. L. Boling; W. C. Young, Providence, R. I., and E. W. Dempsey.—p. 182.
Quantitative Studies of Experimentally Induced Sexual Receptivity in Spayed Guinea Pig. V. J. Collins, J. L. Boling, E. W. Dempsey and W. C. Young, Providence, R. I.—p. 188.
Partial Inhibition of Sex Activity in Intact Female Rat by Injected Estrin. Josephine Ball, Baltimore.—p. 197.
Histologic Effects Induced in Anterior Pituitary of Rat by Prolonged Injection of Estrin with Particular Reference to Production of Pituitary Adenomas. J. M. Wolfe, Nashville, Tenn., and A. W. Wright, Albany, N. Y.—p. 200.
Cellular Changes in Anterior Hypophyses of Vitamin A Deficient Rats. T. S. Sutton and B. J. Brief, Columbus, Ohio.—p. 211.
Postadrenalectomy Diuresis: Effects of Cortical Extracts, Salts and Estrone. R. Gaunt, H. E. Potts and Eleanor Loomis, New York.—p. 216.
Response to Cold Following Double Adrenalectomy. S. M. Horvath, Columbus, Ohio.—p. 223.
Are the Lactogenic and Carbohydrate Metabolism Hormones Identical? A. J. Bergman and C. W. Turner, with technical assistance of P. T. Cupps, Columbia, Mo.—p. 228.
Fatty Atrophy Following Insulin Injection in Nondiabetic Malnutrition. H. Blotner, Boston.—p. 233.

**Testosterone Propionate and Eunuchoidism.**—Kenyon gave four eunuchs subcutaneous injections of 25 mg. of testosterone propionate in sesame oil daily. The injections were given from five to seven times a week for from twenty-eight to ninety-nine days. Thereafter, in three of these, from 10 to 25 mg. was given from three to seven times a week, with interruptions, until the one hundred and eighth to the one hundred and sixty-third day. There was an early increase in erections in the four eunuchs, in three an enlargement of the penis, in all an enlargement of the prostate, in two a distinct deepening of the voice and in three an increase in sexual hair. Hypertrophy of the tissue of the breast occurred in one patient, the size of the testes was unaltered in the two patients studied, but the sperm disappeared during treatment in one of these two, to reappear later. In all four patients there was an increase in body weight, in two accompanied by increased appetite and in two by evident edema. In one there was a slight increase in the basal metabolic rate.

## Indiana State Medical Assn. Journal, Indianapolis

**31: 433-536 (Sept.) 1938**

Incidence and Prevalence of Diseases of the Heart. H. Emerson, New York.—p. 433.
Quantity and Quality of Life. R. L. Sensenich, South Bend.—p. 437.
Prognosis in Bundle Branch Block. G. S. Bond and C. S. Campbell, Indianapolis.—p. 440.
The Psychoneurotic in the General Practice of Medicine. K. A. Menninger, Topeka, Kan.—p. 442.
Ovarian Dysfunctions: Management: Aids to Diagnosis. W. E. Herrell, Rochester, Minn.—p. 445.
Smallpox. F. Dragoo and R. D. Arford, Middletown.—p. 451.
Peptic Ulcer: Present Status of Its Management. A. E. Mahle, Chicago.—p. 452.

## Johns Hopkins Hospital Bulletin, Baltimore

**63: 129-208 (Sept.) 1938**

Prognosis in Cases of Tuberculosis of Tonsils, Adenoids and Cervical Lymph Nodes: Study of Patients Followed for Eleven to Twenty-Three Years. J. Bordley 3d and J. W. Bayler, Baltimore.—p. 132.
Dietary Protein and Regeneration of Serum Albumin: I. Method of Assay and Discussion of Principles. A. A. Weech and E. Goettsch, New York.—p. 154.
Id.: II. Comparison of Potency Values of Beef Serum, Beef Muscle and Casein. A. A. Weech and E. Goettsch, New York.—p. 181.
Intracardiac Tumor Producing Signs of Valvular Heart Disease. C. W. Wainwright, Baltimore.—p. 187.

## Journal of Bacteriology, Baltimore

**36: 111-222 (Aug.) 1938**

*Degeneration and Variation of Gonococci. W. A. Casper, New York.—p. 111.
Studies on Hemolytic Streptococci: V. Characteristics of Human and Animal Strains of Groups A and C. Alice C. Evans and Elizabeth Verder, Washington, D. C.—p. 133.
Nutrient Requirements of Lactobacillus Delbrückii in Lactic Acid Fermentation of Molasses. H. R. Stiles and L. M. Pruess, Terre Haute, Ind.—p. 149.
Absorption of Staphylococcus Bacteriophages by Enterococci. M. L. Rakieten and E. J. Tiffany, Brooklyn.—p. 155.
Microbiology of the Upper Air: III. Improved Apparatus and Technic for Upper Air Investigations. B. E. Proctor and B. W. Parker, Cambridge, Mass.—p. 175.
Colchicine Stimulation of Yeast Growth Fails to Reveal Mitosis. O. W. Richards, New Haven, Conn.—p. 187.
Simple Method for Sterile Filtration of Small Amounts of Fluid. I. N. Asheshov, London, Ont.—p. 197.
Nutrition of Propionic Acid Bacteria. H. G. Wood, A. A. Andersen and C. H. Werkman, Ames, Iowa.—p. 201.

**Degeneration and Variation of Gonococci.**—Casper states that strains of gonococci from fresh cases of acute gonorrhea in the male and classified as two distinct serologic types were transformable from the papilla-bearing to the papilla-free form. The formation of papilla-free colonies is a sign of degeneration probably due to growth on artificial mediums. Diagnostic serums prepared with such degenerated cultures are likely to give rise to errors in classification. Classification based only on colony morphology does not serve to exclude the possibility that one may be dealing not with different types of gonococci but with degenerated forms of the same type which have lost only their type specific carbohydrate. Associated with the loss of carbohydrate in old gonococcus cultures there is a developing relationship between formerly heterologous strains. Since, at the time of isolation of gonococci from acute cases of gonorrhea, one cannot estimate the degree of their degeneration, this fact may explain the relatively high frequency of overlapping strains. In chronic gonorrhea the gonococcus, by adaptation to the human tissue, may undergo the same degenerative processes that occur after prolonged cultivation on artificial mediums. After cultivation on artificial mediums, strains of gonococci which were type specific in the comparative agglutination test were shown by slide agglutination to have mixed-phase colonies.

## Journal of Clinical Investigation, New York

17: 539-698 (Sept.) 1938

President's Address: Clinical Epidemiology. J. R. Paul, New Haven, Conn.—p. 539.

Calcium and Phosphorus Metabolism in Diseases of Thyroparathyroid Apparatus: II. Calcium and Phosphorus Balance (A) Following Therapeutic Radiation of Hyperplastic Thyroid Gland and (B) in Hyperthyroidic Patients Treated with Iodine. F. S. Hansman, with statistical analysis by W. A. C. Fraser, Sydney, Australia.—p. 543.

Study of Tendency to Edema Formation Associated with Incompetence of Valves of Communicating Veins of Leg: Oxygen Tensions of Blood Contained in Varicose Veins. H. E. Holling, H. K. Beecher and R. R. Linton, Boston.—p. 555.

Determination of Cardiac Output in Man at Brief Intervals by a Modification of Ethyl Iodide Method. J. C. Snyder, Boston.—p. 563.

Cardiac Output and Oxygen Consumption of Nine Surgical Patients Before and After Operation. J. C. Snyder, Boston.—p. 571.

Measurements of Circulation in Constrictive Pericarditis Before and After Resection of Pericardium. H. J. Stewart, G. J. Heuer, J. E. Deitrick, N. F. Crane, R. F. Watson and C. H. Wheeler, New York.—p. 581.

Renal Excretion at Low Urine Volumes and Mechanism of Oliguria. L. C. Chesley, Jersey City, N. J.—p. 591.

*Value of Acid Test Meal: Study of Normal Persons and of Persons with Duodenal Ulcer. C. S. Welch and M. W. Comfort, Rochester, Minn.—p. 599.

Placental Interchange: II. Comparison of Total Base Concentration of Fetal and Maternal Blood at Parturition. H. E. Thompson Jr. and W. T. Pommerenke, Rochester, N. Y.—p. 609.

Attempt to Increase Resistance to Pertussis in Newborn Infants by Immunizing Their Mothers During Pregnancy. J. A. Lichty Jr., Betty Slavin and W. L. Bradford, Rochester, N. Y.—p. 613.

Permanence of Recovery in Acute Glomerulonephritis. Emily Nichols Loeb, J. D. Lyttle, D. Seegal and Elizabeth L. Jost, New York.—p. 623.

*Serum Antistreptolysin Titer in Acute Glomerulonephritis. J. D. Lyttle, D. Seegal, Emily Nichols Loeb and Elizabeth L. Jost, New York.—p. 631.

Experience with the Hamilton and Highman Test for Parathyroid Hyperfunction in Chronic Nephritis, Toxic Goiter and Paget's Disease of Bone. D. R. Gilligan, Marie C. Volk and S. L. Gargill, Boston.—p. 641.

Choline-Esterase Activity of Blood Serum in Disease. A. T. Milhorat, New York.—p. 649.

Effect of Artificial Pneumothorax on Anoxemia of Pneumonia. D. Goldstein, M. Block and M. Rosenblüth, New York.—p. 659.

Basal Gastric Secretion in Cases of Peptic Ulcer: Relation of Acidity to Healing of Ulcer. A. L. Bloomfield and L. R. French, San Francisco.—p. 667.

*Requirements for Vitamin C in Man. M. Heinemann, New Haven, Conn.—p. 671.

Use of Globulin Substance Derived from Beef Plasma as a Local Hemostatic in Hemophilia. F. J. Pohle and F. H. L. Taylor, Boston.—p. 677.

Control of Renal Blood Flow and Glomerular Filtration in Normal Man. H. Chasis, H. A. Ranges, W. Goldring and H. W. Smith, New York.—p. 683.

**Value of Acid Test Meal.**—Welch and Comfort used the method evolved by Wilhelmj, Neigus and Hill in obtaining information concerning the relative amounts of acids and alkaline fluids that enter the stomach during the test meal. Twenty-five normal persons and thirty persons who had duodenal ulcer were tested. The test provided an excellent method for studying the factors that regulate acidity of the gastric contents and demonstrated the interplay of dilution and neutralization and of acid secretion. The method permits measurement of the reductions of the concentration of acid chloride in the test fluid during the test period, of the excess of acid or alkaline material in the combined fluids that enter the stomach and of the effectiveness of the factor of dilution. The method does not permit measurement of the total amount of acid secreted, of the total amount of alkali that enters the stomach or of the total neutralization of acid chloride during the test period. It demonstrates the effectiveness of duodenal regurgitation in reducing acidity of the gastric contents and that this reduction is attributable partly to dilution and partly to neutralization. Increased regurgitation of duodenal fluid has again been shown to be an effective means of reducing acidity of the gastric contents. Regurgitation increases the reduction attributable to both dilution and neutralization. The relative importance of the factors concerned in the regulation of acidity of the gastric contents is different in normal persons. The alkaline elements are greater than the acid elements in the fluids entering the stomachs of most normal persons, whereas the reverse holds true in patients who have duodenal ulcer. As a result of this fundamental difference, dilution tends to be 100 per cent effective in normal persons while this is rarely so in cases of duodenal ulcer. Neutralization of the acid chloride of the test solution is usually measurable among normal persons but occurs rarely in duodenal ulcer. The acid secreted by the fundic cells appeared to have a greater average volume in cases of duodenal ulcer than it did in normal persons. While there is evidence that there is a relative deficiency of alkali in the fluid that enters the stomach of patients who have duodenal ulcer, the method does not permit a statement that there is an actual deficiency.

**Serum Antistreptolysin in Glomerulonephritis.**—Lyttle and his co-workers base their study on 116 consecutive and unselected patients with acute glomerulonephritis (ninety-five children less than 13 years of age and twenty-one adults). Many of the patients were admitted to the hospital because of the severity of an infection, and subsequently routine examination showed the presence of nephritis. The majority of patients showed definite clinical and bacteriologic evidence of hemolytic streptococcus infection but many gave only a vague or negative history of preceding infection. Most of the patients in the series showed evidence of infection of the upper part of the respiratory tract preceding or accompanying the onset of acute nephritis. The infection was located in the upper part of the respiratory tract or its appendages in 104 cases. In twelve the data were insufficient to make a clinical diagnosis. The maximal titer of antistreptolysin was usually reached in the first few weeks of the disease, which has its onset about two weeks following the acute infection. The highest antistreptolysin titer in the first forty days after the onset of the nephritis was shown in each case. In 94 per cent of 116 cases the antistreptolysin titer was above 125 units and in 27 per cent the titers were between 1,000 and 2,500 units. Since the authors consider 125 units to be the upper normal level of antistreptolysin, this lends further support to the results of direct culture and indicates that the great majority of patients with acute glomerulonephritis have had a recent hemolytic streptococcus infection. Careful study of the clinical and immunologic data indicate that in the acute stages of glomerulonephritis the maximal antistreptolysin titer (1) is not related to age or sex, (2) has no relation to the severity or duration of the nephritis but (3) is definitely related to the type and severity of the acute infection which precedes or accompanies the acute nephritis.

**Vitamin C Requirements in Man.**—The estimation of the daily requirements of vitamin C depends necessarily on the criteria applied. From a study of the literature Heinemann finds that at least 0.8 mg. of ascorbic acid per kilogram of body weight is used daily by a saturated normal subject. Smaller doses, e. g., 0.5 mg. or even less, are sufficient to protect a person against scurvy. But, even if it is true that smaller doses may assure good health under optimal conditions, it would seem useful to supply the maximal requirements as a factor of safety against altered circumstances which may increase requirements. An abnormally high supply seems to be needed in many diseases (tuberculosis, pneumonia, rheumatism), but this does not appear to be specific for any one disease. Requirements are unusually high in tuberculosis. Tuberculosis predisposes to scurvy by increasing the requirements for vitamin C. Amounts that will meet normal demands become inadequate. Abnormally increased requirements are not specific for tuberculosis, as studies in other diseases show. Requirements have been found to be increased to some extent in patients with peptic ulcer, in whom similar experimental data were obtained by either oral or subcutaneous administration of the vitamin. Saturation tests have revealed that deficiency of vitamin C is rather common in this group of patients, but in only a few cases has manifest scurvy been described.

## Journal Industrial Hygiene & Toxicology, Baltimore

20: 457-496 (Sept.) 1938

Method for Analysis of Dust and Fumes for Lead and Zinc. S. Mosbowitz and W. J. Burke, New York.—p. 457.

Gases from Carbon Arcs: Absence of Ozone. R. W. Cutman and H. G. MacPherson, Cleveland.—p. 465.

Chronic Nicotine Toxicity: IV. Effect of Nicotine-Containing Diets on Histology and Weights of Organs of Albino Rats. R. H. Wilson, J. B. McNaught and F. DeEds, San Francisco.—p. 468.

Radiation as Factor in Heating Canadian Homes and in Body Heat Loss. Ruth C. Partridge and D. L. MacLean, Toronto.—p. 482.

Effect of the Diet in Toxicologic Studies. I. A. Maxwilla, F. J. Baltzbel and P. M. Yamada, Portland, Ore.—p. 492.

## Journal of Investigative Dermatology Baltimore

1: 171-234 (June) 1938

Studies in Contact Dermatitis: III. Active Sensitization with Krameria in Man. M. Grolnick, Brooklyn.—p. 179.

Further Studies in Arsphenamine Hypersensitiveness in Guinea Pigs: I. Cutaneous and Anaphylactic Responses to Old Arsphenamine and to Neoarsphenamine After Sensitization with Old Arsphenamine. W. Frei and M. B. Sulzberger, New York.—p. 191.

Experimental Arsphenamine Sensitization: Further Observations on Reactions to Arsphenamine in Guinea Pigs Given Staphylococcus Toxin and in Guinea Pigs with Induced Streptococcic Infection. F. E. Cormia, Montreal.—p. 199.

Investigation of Method for Preventing Dermatitis from Dress Shields. L. Schwartz and G. C. Andrews, New York.—p. 219.

Effect of Copper in Vitiligo. B. Shaffer, Philadelphia.—p. 225.

## Journal-Lancet, Minneapolis

58: 385-426 (Sept.) 1938

Diagnosis and Office Treatment of Rectal Diseases. W. A. Fansler, Minneapolis.—p. 385.

Uterine Surgical Problems in General Practice. V. S. Counseller, Rochester, Minn.—p. 388.

The Doctor in Health Education. W. W. Bauer, Chicago.—p. 393.

Medical Relief in North Dakota. E. A. Willson, Bismarck, N. D.—p. 395.

What the General Practitioner Should Know About Insanity. L. J. Pankow, Sioux Falls, S. D.—p. 397.

The Management of Abortion. J. H. Moore, Grand Forks, N. D.—p. 402.

The Meaning of "Athletic Heart" Among University Athletes. D. G. Stine, Columbia, Mo.—p. 405.

## Journal of Urology, Baltimore

40: 359-466 (Sept.) 1938

Primary Sympathoblastoma of Left Adrenal with Extension into and Obstruction of Pelvic Cavity of Adjacent Kidney. S. E. Krohn and W. J. Kennedy, Gloversville, N. Y.—p. 359.

Experimental Hydronephrosis in Dogs: I. Composition of Blood Serum. Lillian Eichelberger, with technical assistance of M. Roma, Chicago.—p. 366.

Bilateral Torsion of the Ureter: Case Report and Brief Review of Literature. J. V. Berry, Ottawa, Ont.—p. 378.

Ureterovaginal Fistula Successfully Repaired by Combined Vaginal and Transvesical Operation. H. V. Findlay, Santa Barbara, Calif.—p. 384.

Endometriosis of the Bladder: Report of Case. P. S. Adams, New York.—p. 390.

Myositis Ossificans Following Suprapubic Prostatectomy. J. Schwartz, New York.—p. 397.

Thrombophlebitis of Periprostatic Plexus. A. Hyman and H. Leiter, New York.—p. 403.

Multiple Primary Cancers. H. L. Kretschmer, Chicago.—p. 421.

*Diabetes in Surgical Urology. J. Duff and F. W. Williams, New York.—p. 446.

Practical Cystometer. O. W. Davidson, Kansas City, Kan.—p. 452.

Better Medical Writing: Some Typical Errors and How to Avoid Them. R. M. Hewitt, Rochester, Minn.—p. 454.

Gangrene of Glans Penis and Urethra in a Diabetic. T. M. Townsend and W. M. Flagg, New York.—p. 464.

**Diabetes in Surgical Urology.**—Out of a total of 3,158 patients admitted to their urologic service during a period of five years Duff and Williams diagnosed thirty-nine as having diabetes. Seventeen of these patients were operated on. Such a patient, having undergone proper preoperative treatment, is no greater operative risk than the average well prepared nondiabetic patient. Occasionally emergency operative measures must be undertaken for a diabetic patient who has not received adequate preoperative treatment. In such a case an internist determines the proper dosage of insulin or sugar, or both. As a result of the study of diabetic surgical patients, provided the patient is not dehydrated and shows a minimum of sugar and no acetone in the urine, he is a good surgical risk, irrespective of the amount of sugar in the blood; as a matter of fact a moderately high blood sugar content is regarded as a surgical safety factor. Except for intense pain, there is practically no subjective symptom referable to the urinary tract which may not be of diabetic origin. Four of the diabetic patients died: one from coronary occlusion, two from sepsis and one from postoperative shock. Two patients not operated on died of uremia. There were no deaths directly attributable to diabetes. From the standpoint of the diabetes, there are only two contraindications to operation: marked dehydration and profound coma. These complications of diabetic origin are not encountered frequently, for the diabetes in the urologic age group is usually mild. A patient is considered ready for operation, from the standpoint of his diabetes, if he is not clinically dehydrated, there is no ketosis and glycosuria is 1 per cent or less for twenty-four hours. In patients in profound coma, there must be a differential diagnosis between diabetic and uremic coma.

## Kansas Medical Society Journal, Topeka

39: 325-368 (Aug.) 1938

Cardiovascular Syphilis: Diagnosis and Therapy. A. Arkin, Chicago.—p. 325.

Induced Nontoxic Jaundice (Hyperbilirubinemia) in Patients with Atrophic Arthritis: Second Report. H. E. Thompson and B. L. Wyatt, Tucson, Ariz.—p. 327.

Cycloplegics, Mydriatics and Miotics. L. S. Powell, Lawrence.—p. 330.

Tuberculin Survey of School Children in Sedgwick County. F. C. Beelman, Wichita.—p. 333.

## Kentucky Medical Journal, Bowling Green

36: 349-408 (Sept.) 1938

Production, History, Chemistry, Physics and Biologic Effects of Radium. D. Y. Keith, Louisville.—p. 387.

Results of Radium Treatment of Carcinoma Cervix. J. Love, Louisville.—p. 391.

Scientific Exhibits of the American Medical Association, San Francisco, June 1938. M. Casper, Louisville.—p. 398.

The Transport of Carbon Dioxide in the Blood. H. Lawson, Louisville.—p. 401.

## Laryngoscope, St. Louis

48: 527-614 (Aug.) 1938

What Can Be Done for Chronic Progressive Deafness? (a) Study in Treatment of Deafness. C. S. Nash, Rochester, N. Y.—p. 527.

Id.: (b) Rationale, Technic, Case Reports and Observations with Grafts in the Round Window. W. Hughson, Abington, Pa.—p. 533.

Id.: (d) Surgery of Nasopharynx in Treatment of Chronic Progressive Deafness. H. Walker, Boston.—p. 552.

Tuning Fork Tests Reported in Terms of Decibels. R. J. Hunter, Philadelphia.—p. 560.

Use of Threshold and Louder Sounds in Clinical Diagnosis and Prescribing of Hearing Aids: New Methods for Accurately Determining Threshold for Bone Conduction and for Measuring Tinnitus and Its Effects on Obstructive and Neural Deafness. E. P. Fowler, New York.—p. 572.

Xanthomatosis (Schüller-Christian's Disease): Report of Case with Radiosensitive Pathology in the Mastoid. J. J. Shea, Memphis, Tenn.—p. 589.

Report on Result of Submitting Human Subjects to Rotation. E. R. Arellano, Havana, Cuba.—p. 599.

The Endolymph. L. M. Polvogt, Baltimore.—p. 605.

## Maine Medical Journal, Portland

39: 181-202 (Sept.) 1938

Acute Respiratory Infections: The Upper Respiratory Tract. F. T. Hill and E. R. Irgens, Waterville.—p. 181.

Acute Infection in the Lower Respiratory Tract. D. S. King, Boston.—p. 189.

Ocular Headaches: Some of Their Common Causes. L. H. Berrie, Houlton.—p. 195.

## Michigan State Medical Society Journal, Lansing

37: 765-860 (Sept.) 1938

The Diagnosis of the Right Lower Quadrant. F. Christopher, Evanston, Ill.—p. 783.

Plastic Surgery in Relation to Motor Accidents. W. A. Lange, Detroit.—p. 787.

Fracture of Neck of Femur. F. C. Kidner, Detroit.—p. 792.

Primary Carcinoma of Jejunum. C. D. Brooks, W. R. Clinton and L. B. Ashley, Detroit.—p. 795.

*Use of Dried Bile as Therapeutic Agent. J. M. Winfield, Detroit.—p. 798.

Convulsions Occurring During Nitrous Oxide-Oxygen Anesthesia: Report of Case. C. Gitlin, Detroit.—p. 802.

**Dried Bile in Gastrointestinal Disorders.**—Winfield used dried bile (obtained by drying pig bile in high vacuum) in twenty-seven cases in which there was no loss of bile through drainage but in which there were symptoms which might have been attributable to a deficiency in the quantity or quality of bile in the intestinal tract. The chief symptom for which the dried bile was given was loss of appetite. Best results were obtained in those cases in which there was definite evidence of biliary disease. When the feeding of bile proved efficacious, the increase in appetite was evident usually within a few hours. In an occasional instance, however, anorexia increased even though the underlying factor, a definite biliary disorder, was corrected. Also the associated symptoms of belching, distention and constipation were materially affected in the majority of cases. Dried bile had a slightly laxative effect. The

preparation of dried bile used was soluble. The use of the dried bile forms a simple means of supplying additional bile so necessary for the absorption of vitamin K. The dosages used have been purely empiric. From two to three capsules were given three or four times a day. Each capsule contains 0.35 Gm. of dried bile. One gram of dried is the equivalent of approximately 9 Gm. of gallbladder bile. Since this is real hunger bile and hence quite concentrated, 1 Gm. is equal to at least 90 cc. of liver bile, according to the figures of Rous and McMaster regarding the concentrating activity of the gallbladder.

## Missouri State Medical Assn. Journal, St. Louis

**35: 343-384 (Sept.) 1938**

Medical Participation in a Public Health Program. T. R. Meyer, Clayton.—p. 343.
Hernia Reduced en Masse. A. D. Vail, Springfield.—p. 348.
Nonoperative Treatment of Incipient Cataract. G. H. Poos, St. Louis. —p. 350.
Rare Case of Typho-Ascaridiasis. O. Krueger, Kansas City.—p. 351.
Treatment of Syphilitic Psychoses with Tryparsamide and Therapeutic Fever. P. V. Dreyer, Huntsville.—p. 353.
Aseptic Uretero-Intestinal Anastomosis: Experimental Study. E. J. Jordan, St. Louis.—p. 356.
Sodium Desoxycholate Citrate and Selenite Mediums in Typhoid Fever Tests. Edna L. Smith, Jefferson City.—p. 361.
Self Medication: Report of Case. K. E. Pletcher, Eldon.—p. 365.

## New England Journal of Medicine, Boston

**219: 367-410 (Sept. 15) 1938**

*New Surgical Technic for Treatment of Postphlebitic Varicose Ulcers of the Lower Leg: Preliminary Report. R. R. Linton, Boston.—p. 367.
Osteoporosis in Hyperthyroidism: Reports of Two Cases with Compression Fractures of the Vertebrae. E. C. Bartels and G. E. Haggart, Boston.—p. 373.
Rocky Mountain Spotted Fever in Massachusetts: Report of Case. L. S. Pilcher, Newton Center, Mass.—p. 378.
Ingestion of Iodine as a Method of Attempted Suicide. M. Moore, Boston.—p. 383.
Ménière's Syndrome: Differential Diagnosis and Treatment: Case Report. R. J. Clark, Winchester, Mass.—p. 388.

**Surgical Technic for Postphlebitic Varicose Ulcers.**—Linton recommends the following method of handling postphlebitic varicose ulcers. Cultures are taken before any dressings are applied. These usually show a mixed growth of bacteria; sometimes hemolytic streptococci are present, but most commonly staphylococci. The patient is placed in bed. A blood test is done to rule out syphilis. The leg with the ulcer is elevated on a pillow to the level of the heart or a little above it. Warm 2 per cent boric acid or saline solution compresses are applied to the ulcerated area every two hours. If hemolytic streptococci are present, compresses of surgical solution of chlorinated soda are most efficacious. Under this regimen the condition of the leg and of the ulcer improves rapidly. Unless streptococci have been discovered, the ulcer is usually in a satisfactory condition for cutaneous grafting at the end of a week. The graft requires from ten days to two weeks for a satisfactory take. At the end of this time the patient prepares himself for getting out of bed by doing postural leg exercises for three or four days. These exercises are a modification of those described by Buerger and Allen in that the period of elevation is longer than the period of dependency. When the patient is up he must wear a supporting elastic bandage. One or two days before he is discharged the long saphenous vein of the affected limb is ligated in the groin. Although this vessel may not appear to be varicose it is rare not to find it incompetent in the postphlebitic leg. Sometimes one of the communicating veins between the long saphenous vein and the deep veins in the thigh is incompetent. If such is the case this vessel should be ligated at the same time. If the short saphenous vein is involved it is ligated in the popliteal space. When the patient is discharged home an elastic adhesive bandage is applied directly to the skin from the toes to just below the knee. This is changed every two or three weeks. At the end of six weeks the patient returns to the hospital for ligation of the communicating veins. In the thirty-seven cases treated in this manner the wounds have healed by primary intention. The skin of the lower part of the leg should be carefully cleansed preoperatively with soap and water. If there is scaling or itching, a fungicide is applied twice a day until it is in a satisfactory condition for operating. The location of the ulceration guides one in deciding which group or groups of communicating veins should be ligated. If the ulcer lies on the inner aspect of the lower part of the leg the medial group of communicating veins and the popliteal communicating vein are ligated. If it lies on the anterior surface of the leg it is usually necessary to ligate the anterior group also. When the ulcer is on the posterior or posterolateral surface the lateral group and the popliteal communicating veins are ligated, and in addition the short saphenous vein is ligated in the popliteal space. In a few cases it may be necessary to ligate all the communicating veins. Normal veins are not ligated, so that actually a number of the vessels are preserved. If there is any question as to whether or not they are incompetent it is best to ligate them. The operation is done under spinal anesthesia. Silk is used as the suturing material. After the operation a posterior plaster shell is applied from the toes to just below the knee for immobilization so as to aid healing of the wound. The dressing is done first on the tenth day, when half the stitches are removed. The remainder are taken out from two to four days later, depending on the condition of the wound. If it is well healed, postural exercises of the leg are again instituted before the patient is allowed out of bed. The patient is discharged on the sixteenth to the eighteenth day if the wound is well healed and only one group of veins has been ligated. An elastic adhesive bandage is applied before discharge. This is worn for from two to three weeks. Thereafter a bender bandage or an elastic stocking is worn for a period of from three to six months. This is to control edematous formation. In some cases it is necessary to obliterate the superficial veins with injections of a sclerosing solution; in others this may not be required, as the varicose veins shrink to normal size after their communications with the deep veins have been severed. After several months some patients are able to discard supporting bandages, while others continue to wear them, either because of persistent edema or because of habit.

## New Jersey Medical Society Journal, Trenton

**35: 463-520 (Aug.) 1938**

Medical Management of Gastric Carcinoma. S. W. Johnson, Passaic.—p. 467.
Reticulo-Endothelial System. M. Openchowski, Newark.—p. 468.
Vaccines in the Treatment of Disease. J. A. Kolmer, Philadelphia.—p. 472.
Serums in the Prophylaxis and Treatment of Disease. J. A. Kolmer, Philadelphia.—p. 478.
The True and False in Cardiac Diagnosis. C. Eggleston, New York.—p. 484.
Some Medical Ostracea. F. H. Church, Salem.—p. 489.
Vertigo of Ménière's Syndrome. T. S. P. Fitch, Plainfield.—p. 491.
Heart Disease in Pregnancy: Maternal Welfare Article Number Twenty-Eight. J. B. Gulick, East Orange.—p. 493.

**35: 521-584 (Sept.) 1938**

Rheumatic Heart Disease in Children. J. G. Kaufman, Newark.—p. 525.
Coronary Vascular Disease. H. Halprin, Caldwell.—p. 531.
Tests for Drunkenness in Relation to Motor Accidents. G. Carter, London, England.—p. 537.
Discussion of Some of the Great Advances in Gastro-Enterology. H. M. Eberhard, Philadelphia.—p. 541.
X-Ray Diagnosis of Gastric Cancer. A. J. Dehrio, Paterson.—p. 548.
*Ozone in Oil: Preliminary Study of Its Therapeutic Value. L. F. Bender, Philadelphia, and K. Blanchard, East Orange.—p. 551.
Maternal Mortality Statistics 1937: Maternal Welfare Article Number Twenty-Nine. A. W. Bingham, East Orange.—p. 553.

**Ozone in Oil.**—During the past few months Bender and Blanchard used an ozonide of olive oil as a routine measure in more than 200 cases of acute coryza by instilling 5 or 10 drops in each nostril several times a day by means of an ordinary medicine dropper. In all cases the children were freed from mucous plugs, the nasal airway was cleared and respiratory distress was relieved. In the case of nurslings the routine use of a nasal suction pump about fifteen minutes after the instillation of a few drops has been of decided benefit. This prevents any interruption in the infant's ability to obtain air during the nursing period. Under such conditions the infant does not gulp its food and suffer from excessive air in the stomach. Several cases of impetigo have responded to the ozonide, with and without ultraviolet rays. Two cases of chronic fungoid

infection of the feet cleared up within three weeks. In several cases of eczema the cutaneous condition was greatly improved after consistent use of the ozonide of olive oil in conjunction with a regulated diet.

## New Orleans Medical and Surgical Journal

91: 57-110 (Aug.) 1938

The Family Doctor. C. C. de Gravelles, New Iberia, La.—p. 57.
Genito-Urinary Aspect of Syphilis. J. G. Menville, New Orelans.—p. 58.
Medical Aspects of Syphilis. E. Hull, New Orleans.—p. 60.
Cutaneous Syphilis. J. K. Howles, New Orleans.—p. 62.
Public Health Aspects of Syphilis. J. A. Trautman, New Orleans.—p. 71.
Presacral Sympathectomy. C. G. Collins, New Orleans.—p. 75.
Recent Advances in the Treatment of Pneumonia. C. L. Eshleman, New Orleans.—p. 77.
Conservative Obstetrics and Lowered Morbidity. W. F. Guerriero and C. P. Gray Jr., Monroe, La.—p. 82.
Immunotransfusion in Otology. M. G. Lynch, New Orleans.—p. 89.

## Oklahoma State Medical Assn. Journal, McAlester

31: 261-294 (Aug.) 1938

Acute Coronary Occlusion. W. S. Middleton, Madison, Wis.—p. 261.
Reconstruction Operation for Old Ununited Fracture of the Femoral Neck. P. C. Colonna, Oklahoma City.—p. 266.
Carcinoma of the Prostate. H. S. Browne, Tulsa.—p. 269.
Treatment of Infections of the Prostate. B. A. Hayes, Oklahoma City.—p. 270.
Acute Nephritis and Nephrosis. E. R. Musick, Oklahoma City.—p. 274.
Use of Cautery and Escharotics in the Nose. O. A. Watson, Oklahoma City.—p. 277.

## Public Health Reports, Washington, D. C.

53: 1593-1634 (Sept. 9) 1938

Percentage of Illnesses Treated Surgically Among 9,000 Families, Based on Nation-Wide Periodic Canvasses, 1928-1931. S. D. Collins.—p. 1593.
Two New Species of Ticks (Ixodes) from California (Acarina: Ixodidae). R. A. Cooley and G. M. Kohls.—p. 1616.

## Rocky Mountain Medical Journal, Denver

35: 665-744 (Sept.) 1938

Differentiation of Rash-Producing Epidemic Diseases. R. H. Verploeg, Denver.—p. 687.
Treatment of Pelvic Infections. W. P. McCrossin Jr., Colorado Springs, Colo.—p. 689.
*Influence of Early Diagnosis on Surgical Treatment of Tumors of the Brain. W. M. Craig, Rochester, Minn.—p. 693.
Congenital Defects of the Nose, Lip and Palate: Practical Problems in Their Surgical Correction. A. C. Callister, Salt Lake City.—p. 698.
Tuberculosis Control. A. R. Masten, Denver.—p. 702.
Epistaxis: Etiology and Treatment. J. P. Rigg, Grand Junction, Colo.—p. 705.
Drugs and Narcotics. Sister Rose Paul, Denver.—p. 711.

**Early Diagnosis in Cerebral Tumors.**—Craig states that tumors of the brain diagnosed early are readily amenable to surgical treatment. This applies to the benign encapsulated tumors and the infiltrating malignant gliomas. However, in the early development of tumors of the brain the symptoms are sometimes so vague and uncertain that a definite diagnosis is impossible. In this event a patient can be given sedatives and kept under observation until more definite symptoms have developed or pneumo-encephalography or ventriculography can be carried out. Encephalography should never be undertaken in the presence of increased intracranial pressure, as evidenced by choked disks or papilledema. In the presence of increased intracranial pressure, ventriculography is the procedure of choice. A normal distribution of air in the subarachnoid space, in and around the convolutions of the cortex and within the ventricles rules out the possibility of intracranial tumor. Since the glioma group of tumors has been studied it has been realized that there are certain infiltrating tumors of the brain which, if completely removed with the surrounding tissue, will not recur. These are the tumors which it is important to diagnose before they have invaded too much of the cerebral substance. The more malignant types of tumors tend to recur even if completely removed. The use of high voltage roentgen therapy and radium in the treatment of the more malignant types of cerebral tumors has proved of value in a certain number of cases. The more radiosensitive types of tumor respond by an alleviation of the acute symptoms. Roentgenotherapy should augment surgery and should not be used as a primary method of treatment.

## Virginia Medical Monthly, Richmond

65: 515-582 (Sept.) 1938

The Lure of Medicine. H. A. Christian, Boston.—p. 515.
Of Sin and Punishment. J. K. Hall, Richmond.—p. 518.
Treatment of Burns. T. K. McKee, Saltville.—p. 522.
Biopsy of Cervix Uteri. W. H. Parker, University.—p. 523.
Injection of Internal Hemorrhoids. E. H. Terrell, Richmond.—p. 526.
Fractures of the Femur. M. H. Todd, Norfolk.—p. 527.
Prognostic Significance of QRS Changes in Acute Coronary Thrombosis. N. Bloom and Grace Cashon, Richmond.—p. 530.
Lymphopathia Venerea (Lymphogranuloma Inguinale). L. W. Holladay, High Point, N. C.—p. 536.
The Surgical Emergency. H. W. Kinderman, Hampton.—p. 538.
Sinusitis, Office and Home Care. T. A. Poole, Washington, D. C.—p. 543.
Complex Consciousness in Religious Delusions: Case Report. L. I. Hallay, McClure.—p. 544.

## Western J. Surg., Obst. & Gynecology, Portland, Ore.

46: 451-512 (Sept.) 1938

Relation of Estrogenic and Gonadotropic Hormones to Climacteric Symptoms. Kathleen M. Murphy and C. F. Fluhmann, San Francisco.—p. 451.
*False Positive Wassermanns in Cerebrospinal Fluid. A. J. McLean, Portland, Ore., and I. C. Munger Jr., Vancouver, Wash.—p. 455.
Renal Changes Following Toxemias of Late Pregnancy. E. W. Page, Berkeley, Calif., and A. J. Cox, San Francisco.—p. 463.
Uterine Retrodisplacements, Retrograde Menstruation and Endometriosis. R. E. Watkins, Portland, Ore.—p. 480.
Endothelial Myeloma (Ewing's Sarcoma) with Metastases to the Vulva. A. Mathieu and P. H. Moore, Portland, Ore.—p. 495.
The Psychologic Abdomen: Its Surgical Importance: Division II. B. L. Diamond, San Francisco.—p. 498.

**Falsely Positive Wassermann Reactions of Cerebrospinal Fluid.**—McLean and Munger's interest in the circumstances of falsely positive reactions was aroused almost a decade ago by a case of craniopharyngioma in which, on the basis of a single determination of an indisputably positive Wassermann reaction of the spinal fluid (with negative reaction of the blood), prolonged arsphenamine treatment had been given elsewhere, despite progressive disabling and localizing intracranial signs. The Wassermann reaction of the spinal fluid and blood was negative when successful operation was done on the tumor. Because fluid from the craniopharyngioma usually contains abundant macroscopically visible cholesterin crystals, the assumption was currently made that such extravasated fluid might be the cause of the falsely positive Wassermann reaction. Further cases have since been sought and ten are reported (encephalomalacic atrophy, trauma, cerebrospinal rhinorrhea, electrical burn and neuritis). In most of these the common factor appears to be destruction or degradation of neuroprotein and neurolipid in areas in which cerebrospinal fluid stasis is occurring—the teleologic function of the latter in these circumstances merely allows concentration of a reagent otherwise minimally present. The three most likely possibilities as to the nature of this unknown reagent may be as follows: 1. A reagin globulin truly analogous to syphilitic reagin may be elaborated directly during the degradation of neuroprotein. 2. Although the role of phanerosed cholesterol appears innocent from the authors' experiments, other degradation neurolipids (abnormal split products) present in such cerebrospinal fluid may combine with test antigen so as to sensitize the latter far beyond its usual titer and thus give rise to falsely positive reactions. 3. The mere presence of increased nonspecific protein produced during the degradation may, as in serum, offer such physicochemical inhibition of the usual measured dose of added complement for spinal fluid in routine tests that a falsely positive reaction would result. The minimum of laboratory work on any sample of spinal fluid should include cell count, differential count, and globulin, total protein, Kolmer and Lange tests. If the diagnosis indicated by laboratory tests is not in accord with the clinical observations, more fluid should be obtained and the tests should be repeated by two laboratories; the Wassermann-Kolmer test should then be done on spinal fluid with and without preliminary inactivation and the result should be checked by flocculation concentration tests. If the laboratory results still disagree with the clinical facts, the tests should be repeated in three or four weeks; if the reaction is still positive, specific therapy should be tried, though not before this.

## FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

### British Journal of Dermatology and Syphilis, London

50: 399-486 (Aug.-Sept.) 1938

Recent Advances in Leprosy and Methods Adopted for Dealing with the Problem in France. C. Flandin.—p. 399.
*Question of Etiology of Pemphigus Vulgaris and Dermatitis Herpetiformis (Duhring's Disease): Clinical Experimental Study. A. Dostrovsky, I. Gurevitch and H. Ungar.—p. 412.
New Technic for Epilation of the Scalp: To Provide More Even Distribution of Dose Than That Obtainable in Adamson-Kienböck Technic. E. H. Molesworth and H. L. Brose.—p. 435.
Four Area Method in X-Ray Epilation of Scalp. S. C. Shanks.—p. 440.
Match and Match-Box Dermatitis. R. Klaber.—p. 451.

**Etiology of Pemphigus and Dermatitis Herpetiformis.**—Dostrovsky and his co-workers have carried out experiments since 1936 with the transmission of material from patients with pemphigus vulgaris and Duhring's disease. They used the contents of the vesicles, extract of the vesicular wall and blood serum of the patients. The injections were made into the cisterna, the brain and, to a smaller extent, intravenously into rabbits. There were no cutaneous manifestations on the rabbits, but disorders of the central nervous system occurred. This reaction is known to occur in other diseases which are caused by a filtrable virus; e. g., Hodgkin's disease and herpes zoster. There was a marked difference in the clinical picture of spontaneous encephalitis and that appearing in the rabbit during the experiments. The control experiments and the negative cases prove to the authors that spontaneous encephalitis is not encountered frequently. The most suitable material in the study was the vesicular fluid. The percentage of positive results achieved with this material was considerable. It was not dependent on whether it was sterile from the beginning or had to be filtered because of contamination. Cerebrospinal fluid also produced positive results. Experiments with blood serum were all negative except one. The best method of injecting the material to obtain positive results was into the cisterna. This fact impairs the value of the experiments to a certain extent, since it should be assumed that the virus injected under the dura of the experimental animal should bring about the same number of affected rabbits. It is possible that for intravenous injection more material is needed; i. e., a more massive infection. The authors succeeded in bringing about the clinical picture of encephalomyelomeningitis in 43 per cent of the rabbits. The condition has been verified by histologic examination in about 50 per cent of the cases. These facts lead them to the conclusion that, probably, there is some filtrable virus which produces pemphigus vulgaris and Duhring's disease belonging to the group of the neurotropic viruses and that the two diseases belong to the same group. Passage experiments furnished further proof for this hypothesis, although these experiments showed positive results in only three instances and in only the first passage. The possibility that the virus is an accompanying and not the true cause of pemphigus vulgaris and Duhring's disease should not be overlooked.

### British Medical Journal, London

2: 387-436 (Aug. 20) 1938

Rheumatoid Arthritis. W. Edgecombe.—p. 387.
Orthopedics in Rheumatoid Arthritis. N. Capener.—p. 391.
Effect of Spontaneous Jaundice on Rheumatoid (Atrophic) Arthritis: Attempts to Reproduce the Phenomenon. P. S. Hench.—p. 394.
*Sulfamidochrysoidine, Sulfanilamide and Benzylsulfanilamide in Treatment of Erysipelas: Controlled Series of 242 Cases. W. R. Snodgrass, T. Anderson and J. L. Rennie.—p. 399.
Late Results of Surgical Treatment in Perforated Peptic Ulcer. J. V. Cable.—p. 403.

**Sulfanilamide Compounds and Erysipelas.**—Snodgrass and his collaborators compared the therapeutic value in 242 cases of erysipelas of sulfamidochrysoidine (original prontosil), *p*-aminobenzenesulfonamide (sulfanilamide) and *p*-benzylaminobenzene-sulfonamide (proseptosine). The patients were more than 5 years of age whose condition was diagnosed as erysipelas after admission to Ruchill Hospital. The 242 patients were divided into eight groups of thirty (fifteen male and fifteen female patients in each group) and each group received respectively at intervals of four hours 1 or 2 Gm. of proseptasine, 1 or 2 Gm. of sulfanilamide, 1 or 2 Gm. of the prontosil or 0.5 or 0.75 Gm. of sulfanilamide. There were five deaths. Of fifty-eight patients receiving the prontosil 86.2 per cent had no further spread of the lesion after twenty-four hours; of the 120 patients receiving sulfanilamide the equivalent percentage was 88.3, while of the fifty-eight who received proseptasine the percentage was only 68.9. With regard to the various subgroups receiving sulfanilamide little can be said: there is a slightly better outcome during the first day for patients receiving the larger doses but the difference is small and insignificant. There is no significant difference between the various results. After forty-eight hours, pyrexia had ceased in 77.6 per cent of the patients receiving the prontosil, in 72.1 per cent of those receiving sulfanilamide and in 74.1 per cent of those receiving proseptasine. Of the fifty-eight patients receiving the prontosil the percentage having no toxemia after the third day was 63.6; the equivalent percentage was 59 for the 122 receiving sulfanilamide and 29.3 for the fifty-eight patients receiving proseptasine. These percentages reflect unfavorably on the action of proseptasine. No recurrence took place in any case during the period of stay in the hospital, nor has any patient been readmitted with a recurrence one month after the closing of the records. The incidence of complications was 13.8 per cent in those patients receiving the prontosil, 6.6 in those receiving sulfanilamide and 13.8 in those treated with proseptasine.

2: 437-480 (Aug. 27) 1938

Toxic and Infective Jaundice. C. E. Lakin.—p. 437.
Methods of Testing for Color Vision and Theoretic Deductions from Observations on Color Vision. H. E. Roaf.—p. 440.
Some Cardiologic Fallacies. J. W. Linnell and W. A. R. Thomson.—p. 442.
*"Restropic" Activity of Blood. C. Wetzler-Ligeti and B. P. Wiesner.—p. 444.
Treatment of Carcinoma in Pharynx and Larynx by Irradiation. C. Hamblen-Thomas.—p. 447.
*Helium in Anesthesia. W. S. Sykes and R. C. Lawrence.—p. 448.
Cardiazol Therapy in Stupor. J. S. Harris and C. R. Binnie.—p. 449.

**"Restropic" Activity of Blood.**—Wetzler-Ligeti and Wiesner find that the blood of rabbits, horses and healthy human subjects contains a factor that stimulates the activity of the reticulo-endothelial system (positive restropic factor). Positive restropic activity seems to persist in disease, except in malignant disease, when, as a rule, the normal activity is reversed and a negative restropic factor is found. The data show that disease in general, with the exception of malignant disease, does not fundamentally alter the restropic activity of the blood. As a rule a positive factor is present even in severe nonmalignant conditions. The concentration of restropin may be higher in some diseases than in health, but confirmation is required. Both in normal subjects and in various clinical conditions the concentration of positive restropin may fall so low that there may be no effect on the reticulo-endothelial system of the test animal. The origin of negative restropin is more obscure than that of the positive factor. In experiments with pituitary extracts negative activity was found to be associated with the thyrotropic factors; in the present experiments no obvious thyrotropic activity was noted to attach to the negative extracts. Moreover, these extracts were toxic in many instances—a property not observed in corresponding doses of thyrotropic extracts. The biologic significance of the observations under discussion is open to several purely provisional interpretations. It could be considered that the reticulo-endothelial system is involved in the maintenance of immunity and resistance; the presence of positive restropin possibly reflects or conditions the active state of the system. Conversely, the development of negative restropic activity in the blood might tentatively be regarded as a manifestation of a severe disturbance of the function of the reticulo-endothelial system. The fact that negative restropic activity has been demonstrated up to the present time only in cases of malignant disease is possibly significant, for it has long been assumed that the systemic changes that develop in malignant disease extend to the reticulo-endothelial system.

**Helium in Anesthesia.**—Since no patients with respiratory difficulties were available, Sykes and Lawrence carried out experiments on themselves, using artificial obstructions. They

found that an artificial atmosphere of helium and oxygen is theoretically and practically about twice as easy to breathe as ordinary air, and the mixture should be of great value in cases of respiratory obstruction or in cases in which it is essential to economize muscular effort. When obstruction is present its value is immediately apparent and can be measured by simple timing experiments. Even if there is no obstruction, in which case it has no visible effect, it might still be of value in reducing the amount of work done by the patient and, because of its low solubility, in preventing postoperative collapse of the lung.

## East African Medical Journal, Nairobi

15: 129-164 (Aug.) 1938

Treatment of Pulmonary Tuberculosis by Direct Injection of Lungs. H. N. Davies.—p. 135.
Strangulation of Spleen with Acute Intestinal Obstruction: Case. T. F. Anderson.—p. 141.
Night Blindness and Vitamin A in African School Boys. A. McKenzie. —p. 143.
Epithelioma in an Albino Native: Report of Case. M. Roberts.—p. 148.

## Indian Journal of Medical Research, Calcutta

20: 1-326 (July) 1938. Partial Index

Detection of Malnutrition by Measurements of Arm, Chest and Hip. W. R. Aykroyd, K. B. Madhava and K. Rajagopal.—p. 55.
Study of Myelin Degeneration in Polarized Light. M. V. Radhakrishna Rao.—p. 103.
Variations in Iron Content of Foodstuffs and the Problem of Iron Requirements. S. Ranganathan.—p. 119.
Diet and Physique Survey in Assam, Rural Bengal and Calcutta. H. E. C. Wilson and D. D. Mitra.—p. 131.
Pyrophosphate in Determination of Vitamin C Content of Plant and Animal Tissues. K. V. Giri and N. S. Doctor.—p. 165.
*Vitamin C and Peptic Ulcer. M. Narasimha Rao.—p. 171.
Observations on Basal Metabolism of Healthy Subjects Under Varying Conditions of Temperature and Humidity. B. Ahmad, R. B. Lal and N. C. Roy.—p. 205.
Investigations into Epidemiology of Epidemic Dropsy: Part VI. Allylisothiocyanate as an Etiologic Factor in Epidemic Dropsy. R. B. Lal, B. Ahmad and S. C. Roy.—p. 213.
*Virus of Sandfly Fever in Culture and Certain of Its Properties. H. E. Shortt, C. G. Pandit and R. Sanjiva Rao.—p. 229.
Some Biochemical Characteristics of Snake Venom. A. C. Roy and R. N. Chopra.—p. 241.
Use of Nonspecific Substances in Production of Tetanus and Diphtheria Antitoxin. D. C. Lahiri.—p. 311.
Immunization of Horses for Production of High-Titer Tetanus Antitoxin: Part II. N. N. Ray and G. C. Das.—p. 317.

**Vitamin C and Peptic Ulcer.**—Narasimha Rao estimated the vitamin C content of the blood of fifteen patients with peptic ulcer. A variation of from 0.4054 to 1.92 mg., with an average of 0.8971 mg., was observed. These values are nearly identical with values in healthy control subjects. Therefore he concludes that there is no gross vitamin C deficiency in patients suffering from gastric or duodenal ulcers.

**Virus of Sandfly Fever.**—Shortt and his associates cultivated the virus of sandfly fever by the chorio-allantoic membrane technic and in tissue culture. The cultures were carried through numerous passages. The serums of patients who had recovered from sandfly fever possessed the power of neutralizing the cultured virus. The animal inoculation experiments of the cultured virus by the intracerebral, intranasal, intraperitoneal and subcutaneous routes gave inconclusive results.

## Journal of Physiology, London

93: 173-304 (Aug. 15) 1938

Mechanism of Inhibition and Excitation of Crayfish Muscle. G. Marmont and C. A. G. Wiersma.—p. 173.
Changes in Muscle Contraction Curves Produced by Drugs of Eserine and Curarine Groups. Grace Briscoe.—p. 194.
Degenerative Changes in Axis Cylinders of Dental Nerves Due to Diets Deficient in Vitamin A and Carotene. J. D. King, W. Lewinsky and D. Stewart.—p. 206.
Action of Eserine-like and Curare-like Substances on Responses of Frog's Nerve-Muscle Preparations to Repetitive Stimulation. S. L. Cowan.—p. 215.
Dependence of Activity of "Apneustic Center" on Carbon Dioxide of Arterial Blood. G. Stella.—p. 263.
Micro Blood Volume Method Using Blue Dye and Photocell. J. A. Kennedy and G. A. Millikan.—p. 276.
Neuromuscular Conduction in the Fowl. G. L. Brown and A. M. Harvey.—p. 285.
Plethysmographic Method for Measuring Systolic Blood Pressure in the Intact Rat. F. B. Byrom and C. Wilson.—p. 301.

## Lancet, London

2: 409-466 (Aug. 20) 1938

Rhythm in Epilepsy. G. M. Griffiths and J. T. Fox.—p. 409.
Tropical Macrocytic Anemia: Its Relation to Pernicious Anemia. Lucy Wills and Barbara D. F. Evans.—p. 416.
Meningo-Encephalitis and Orchitis as the Only Symptoms of Mumps. W. Harris and H. Bethell.—p. 422.
Some Biologic Properties of Diethylstilbestrol. S. J. Folley and Helen M. S. Watson.—p. 423.
Chronic Meningococcic Septicemia Treated with 2-(*p*-Aminobenzenesulfonamido) Pyridine. S. B. Dimson.—p. 424.
*Stomatitis of Vitamin $B_2$ Deficiency Treated with Nicotinic Acid. P. Manson-Bahr and O. N. Ransford.—p. 426.
Paralysis of External Pterygoid Muscle Arising from Injury to the Fifth Cranial Nerve. H. Gardiner.—p. 428.

**Vitamin $B_2$ Stomatitis and Nicotinic Acid.**—Manson-Bahr and Ransford draw attention to the benefit which may attend the administration of nicotinic acid in states which can be described as prepellagrous. An instance of sore tongue is cited. In temperate climates the cutaneous lesions of pellagra do not appear and deficiency of the pellagra-preventing factor shows itself by stomatitis, a characteristic desquamation of the tongue and chronic diarrhea. The case cited is that of a woman of 62 who had suffered from these symptoms for five years and recovered rapidly with 150 mg. of nicotinic acid daily for ten days and a full diet. The authors believe that many similar cases are encountered in general practice in England.

2: 549-602 (Sept. 3) 1938

The Iron Deficiency Anemias. R. B. Scott.—p. 549.
Angle of Abduction of Hip After Subtrochanteric Osteotomy. H. J. Seddon.—p. 552.
Experimental Exchange Transfusion Using Purified Heparin. W. Thalhimer, D. Y. Solandt and C. H. Best.—p. 554.
*Use of Synthetic Desoxycorticosterone Acetate in Addison's Disease. S. L. Simpson.—p. 557.
Acute Ulcerative Stomatitis. E. W. Fish.—p. 558.
Hyperplastic Tuberculosis of the Cecum, with Special Reference to Radiologic Diagnosis. F. G. Wood and M. C. Wilkinson.—p. 560.
*Antibacterial Power of Blood of Patients Receiving 2-(*p*-Aminobenzenesulfonamido) Pyridine. A. Fleming.—p. 564.

**Desoxycorticosterone Acetate in Addison's Disease.**—Simpson found a synthetic product, desoxycorticosterone acetate, approximating in chemical formula to corticosterone, effective in two patients with Addison's disease. It has a therapeutic action in Addison's disease similar to that of extract of the suprarenal cortex (cortin). From the cases recorded it appears that 6 mg. of desoxycorticosterone acetate (1 cc. of oily solution) is equivalent to more than 5 but less than 20 cc. of cortin. The first patient, with severe suprarenal insufficiency, gave an equivocal response, but the second was undoubtedly benefited to a far greater degree than when receiving cortin. The injections were given intramuscularly and were not painful, although a transient localized stinging sensation sometimes resulted.

**Blood After Sulfanilamide Compound.**—It 2-(*p*-aminobenzene-sulfonamido) pyridine acts by virtue of its bacteriostatic power then the blood of patients taking it should possess an increased power of restraining the growth of bacteria that are sensitive to its action. Fleming describes experiments showing that the action of the blood of patients taking the drug does not differ materially from the action (described in an abstract in THE JOURNAL Sept. 17, 1938, page 1140) of blood mixed with the chemical after withdrawal from the body. The blood specimens used in these experiments were taken from three patients who were being treated with the drug. The blood of the patients has a much increased antibacterial power against hemolytic streptococcus and pneumococcus. This increased antibacterial power resides in the serum. The efficiency of the leukocytes is not increased. A patient's serum which is strongly inhibitory to streptococci is incapable of killing the cocci in two days. The patient's serum not only inhibits growth but also inhibits the production by Streptococcus pyogenes and pneumococcus of substances which alter the blood. The drug added to human blood or contained in the blood of patients taking the chemical does not prevent encapsulation of pneumococci. A more likely mode of action is simple inhibition of growth (and possibly of toxin production), and while the organism's growth is stopped and its vitality lowered some agent in the body damages the capsule, or perhaps some autolytic process occurs.

## Archives des Maladies de l'Appareil Digestif, Paris

28: 673-792 (July) 1938

Role of Fats in Glycogenesis and Utilization of Alimentary Proteins. F. Maignon.—p. 673.
Duodenal Tubage with Aid of Pliant Rubber Tube Provided with Mandrin. C. S. Schlumberger.—p. 689.
*Pathogenic Importance of "Lamblia Intestinalis." L. de Friedrich.—p. 693.
Pharmacodynamic Research on Morphology of Cellular Secretions. G. Wallisch.—p. 722.

**Pathogenic Importance of Lamblia Intestinalis.**—De Friedrich has observed forty cases of infestation with Lamblia intestinalis since 1927. He lists in tables the ages of the patients, the duration of the lambliasis and the chief complaints of the patients. He shows that diarrhea is the most frequent symptom; that a large number of patients complain of pains in the biliary region and that others have various gastrointestinal disorders. He observed a grayish-yellow and swollen appearance of the face in some of the cases, but he does not consider this necessarily characteristic for lambliasis. The gastric acidity is normal in the majority of cases. Roentgenoscopy of stomach and intestine reveal normal conditions in the majority and cholecystography generally discloses that the gallbladder is well filled. After discussing the examination of the feces, particularly the search for lamblia, the author shows that examination by means of the duodenal tube is the best method for the detection of lambliasis. The question whether lambliasis always requires treatment he answers in the affirmative, because he is convinced that it is harmful for the organism. He admits that as yet no specific remedy is available for lambliasis. He lists the various therapeutic substances that have been recommended. He himself tried emetine, and the intravenous and intraduodenal administration of neoarsphenamine, also methylene blue and acriflavine hydrochloride. He regards the intraduodenal administration of arsphenamine combined with duodenal lavage as the best treatment. To be sure, relapses are frequent; there are spontaneous remissions in connection with the maturation of the organisms. Lamblia may appear as a harmless parasite; nevertheless, it is never certain when the time will come when the lamblia will multiply and provoke disturbances, and so it is always advisable to institute treatment when lamblia are detected. Cholecystectomy is not indicated, because it does not cure, and there is no definite proof that lamblia are constantly in the gallbladder. The functional disorders are caused by their presence in the duodenum and by their multiplication. Moreover, the lamblia may cause other disorders and so it is necessary to examine the entire digestive tract in order not to overlook an ulcer, cholelithiasis and so on.

## Bulletin de la Soc. de Gynéc. et d'Obst., Paris

27: 405-484 (June) 1938

*Clinical and Physiologic Bases of Functional Uterine Hemorrhages Caused by Hormone Disturbances of Ovaries. C. Béclère.—p. 405.
Study of Speed of Sedimentation of Erythrocytes in Gynecology. E. Benes.—p. 413.
Remarks on pH of Cervical Orifice. Palmer and Michon-Adjonbel.—p. 416.
Two Roentgenograms of Intracervical Cancer Discovered by Means of Lipiodol. P. Lejeune.—p. 420.
Fetal Heart Sounds in Pregnant Women: Phonocardiographic Method. C. Lian, V. Golbin and G. Minot.—p. 423.

**Uterine Hemorrhages from Hormone Disturbances.**—Béclère discusses the clinical and physiologic bases of functional uterine hemorrhages of ovarian origin which indicate not only the close relations between abnormal functional hemorrhages and normal menstrual hemorrhages but also the intimate connections between functional hemorrhage and the hormonal action of the ovary. Summarizing the clinical aspects of the uterine hemorrhages before and after the menopause, he states: 1. There is the spontaneous menopause, which leads to spontaneous cure of functional premenopausal hemorrhages after years of disturbances and hemorrhages. 2. In two thirds of the patients with premenopausal functional hemorrhages there exists a pathognomonic clinical syndrome, which has three characteristic aspects: (*a*) sudden irregularity of the normal menstrual periods, (*b*) complete disappearance of the normal menstrual hemorrhages, which are replaced by irregular menometrorrhagias, (*c*) phases of amenorrhea alternating with hemorrhagic phases. 3. In other cases (about 10 per cent), the clinical syndrome is purely menorrhagic; the menses preserve their normal periodicity. 4. In another 10 per cent of the cases, the syndrome is entirely polymenorrheal; that is, the rhythm of the menses is shortened. 5. There are two particular clinical conditions which are intermediate between the normal menopause and the premenopausal functional hemorrhages: (*a*) menopause in stages in which amenorrheal phases alternate with phases of normal menstruation; (*b*) menopause with irregularity of the normal rhythm of the menses but with conservation of the normal duration and abundance. In giving his attention to the physiologic aspects he shows that the cause of these uterine hemorrhages is a hormonal disorder of the ovary and that their physiologic mechanism is the same as that of the normal menstrual flow. He points out that abnormal uterine hemorrhages as well as the normal menstrual flow can be made to disappear by the surgical removal of the ovaries, without the uterus being touched. Moreover, roentgen therapeutic suppression of the functional activity of the ovaries will accomplish the same. In some cases of functional hemorrhages an excess of estrogenic substance has been demonstrated in the blood and urine. Moreover, glandular hyperplasia has been produced after ovariectomy by means of the administration of large doses of estrogenic substance. He emphasizes that functional hemorrhages, like the normal menstrual flow, are provoked by the hormonal secretion of the ovary. Both are accompanied by modifications of the uterine mucosa and both are, by way of the ovary, partly dependent on the secretion of the anterior hypophysis. The author further reviews the results of the extirpation of the ovaries in animals and in women. Discussing the hormone therapy, he says that if there exists an excessive stimulation of the anterior lobe of the hypophysis in functional hemorrhages, the treatment should consist in checking the hypophysis. In order to check the hypophysis without stimulating the ovary, androgen is injected. Favorable effects have been reported with this treatment in some uterine hemorrhages of young girls, in premenopausal hemorrhages and in cases of fibroma.

## Schweizerische medizinische Wochenschrift, Basel

68: 1023-1044 (Sept. 3) 1938. Partial Index

Pathogenesis of Neurasthenia According to Theories of Janet. L. Schwartz.—p. 1025.
*Addition of Vitamin C to Histidine in Treatment of Gastroduodenal Ulcer. M. Demole and P. Guye.—p. 1028.
*Benzedrine in Treatment of Postencephalitic Parkinsonism. M. Dresslar.—p. 1031.
When and Where Does Cyanosis Exist? K. Leuggenhager.—p. 1032.
New Aspects of Diagnosis of Gonorrhea of Female Urogenital Apparatus. M. Spitzer.—p. 1034.

**Vitamin C and Histidine in Gastroduodenal Ulcer.**—Demole and Guye point out that observations in recent years have raised the question whether a deficiency of vitamin C might be an etiologic factor in gastroduodenal ulcer. Clinical as well as experimental studies seem to lend support to this theory. The authors having obtained comparatively favorable results with histidine in the treatment of gastroduodenal ulcer, they decided to combine histidine and vitamin C. Since October 1936 they treated patients with gastroduodenal ulcer systematically with a histidine preparation to which ascorbic acid had been added. The preparation that they employed contained, in ampules of 5 cc., 0.209 Gm. of hydrochloride of histidine and 0.176 Gm. of ascorbic acid. Daily intramuscular injections was the mode of administration. The number of injections varied. The prescribed number for a series was twelve and only in especially refractory cases was the number increased to eighteen. The combination of histidine and ascorbic acid was employed in forty-eight cases, and although the authors regard a definite evaluation of this treatment as premature, they compare the results of the combination therapy with those produced by histidine alone. Of thirteen patients, who previously had been unsuccessfully treated with histidine, ten could be considered cured by the addition of ascorbic acid. The authors suggest that the presence of an adequate or excessive amount of ascorbic acid in the organism favors the cure of the ulcer, in that, after the ulcerous region is modified by the ascorbic acid, the histidine can exert its action more effectively. If, as they think, the ascorbic acid does not exert a direct, causal effect on the gastroduodenal ulcer, but rather favors cicatrization and intensifies the action of histidine, the question arises whether other vitamins

may perhaps exert a similar effect. They suggest that vitamins A and B, may perhaps be of value, and they are extending their investigations in this direction.

**Benzedrine in Postencephalitic Parkinsonism.**—Dressler mentions the various treatments that have been employed in postencephalitic parkinsonism and directs especial attention to the use of benzedrine (beta-phenylisopropylamine). It was decided to try this substance after favorable results had been obtained with it in narcolepsy. The author mentions investigators who employed beta-phenylisopropylamine with good results in postencephalitic parkinsonism. He says that the impression was gained that beta-phenylisopropylamine is to a certain extent specific for postencephalitic parkinsonism. It was observed also that many of the symptoms of parkinsonism, and especially the facial spasms, are influenced more by the combined administration of beta-phenylisopropylamine and scopolamine than by beta-phenylisopropylamine alone. The author says that the medication with beta-phenylisopropylamine is begun by giving one half tablet (2.5 mg.) before breakfast and before the noon meal. The individual dose is gradually increased by one half tablet until an optimal action is obtained. A daily dose of between 10 and 30 mg. is usually sufficient, but in exceptional cases as much as 60 mg. may be given per day. If complications arise, the dose must be reduced. The effect of the medication becomes noticeable after thirty or sixty minutes and persists for from three to twelve hours. The scopolamine is given in doses of from 0.3 to 0.6 mg. Contraindications to the use of beta-phenylisopropylamine are cardiac and vascular diseases, especially hypertension and coronary disorders and manic states and excitation. The author admits that his investigations on the use of beta-phenylisopropylamine in postencephalitic parkinsonism are not yet completed. He reports the clinical history of a case in which the immediate result of the treatment was surprisingly favorable, but he admits that as yet he is unable to give a definite estimate of the value of the continuous treatment.

## Atti d. Soc. Ital. Ostetricia e Ginecologia, Rome

**34:** 577-784 (July-Aug.) 1938. Partial Index

Estrogenic Substance in Urine in Amenorrhea and Its Variations After Treatment with Estrogenic Substance. N. Borsetti.—p. 593.
*Kustallow's Test for Pregnancy. F. Bentivoglio.—p. 596.
Practical Value of De Boisseson Friedmann's Modified Reaction. P. Rossi.—p. 615.
Chorioepithelioma Rapidly Developed After Parturition at Full Term: Case. L. Roffo.—p. 646.
Behavior of Glycemia in Cancer of Uterus After Irradiations. A. Chimenti.—p. 673.
Sedimentation Speed of Erythrocytes in Puerperal Infection. M. Amendola.—p. 674.

**Kustallow's Pregnancy Test.**—Bentivoglio discusses the diagnostic value of Kustallow's pregnancy test. The test was reported in *Zentralblatt für Gynäkologie*, Jan. 30, 1937, page 629, and abstracted in THE JOURNAL April 10, 1937, page 1307. A drop of hay solution with infusoria is placed on a slide (uncovered) and examined under the microscope. Kustallow claimed (1) that the addition of a drop of urine of pregnant women to the hay solution with infusoria arrests the movements and produces rapid agglutination of infusoria with destruction of the animalcules following, (2) that the test is positive in pregnancy and for as long as pregnant products remain in the organism and negative in the urine of nonpregnant women and (3) that it is caused by proteins, lipoids, carbohydrates and hormones contained in the urine of pregnant women. Bentivoglio examined the urine of 130 women by Kustallow's technic. The group included normal women, women in normal and pathologic pregnancy at different months of evolution, women in the puerperium (first week) and diseases of the internal genitalia in nonpregnant women. The results were nonspecific and conflicting. The author found that positivity of the reaction depends on the specific gravity of the urine and on the $p_H$ of the urine, regardless of whether it is from pregnant or from nonpregnant women. The greater the specific gravity of the urine, or the more intense the acidity or alkalinity of the urine, the more rapid the inhibition of the movements with infusoria. As collateral work for verification the author added a drop of either estrogen or histidine solutions to the drop of hay solution with infusoria and examined it through the microscope. He found that the movements of the animalcules are not arrested by the addition of these solutions. The author denies any diagnostic value and specificity for Kustallow's pregnancy test.

## Revista Médica de Rosario, Rosario de Santa Fe

**28:** 669-796 (July) 1938. Partial Index

Tumors of Hypophysis. T. Fracassi.—p. 669.
Surgical Intervention on Hypophysis Through Intranasal Route. M. González Loza.—p. 706.
*Pathologic Anatomy of Bleeding Breast. C. Sylvestre Begnis.—p. 710.
Hemorrhagic Purpuric Diseases. T. C. Minnhaar.—p. 741.

**Bleeding Breast.**—Sylvestre Begnis observed nine cases of bleeding breast, in three of which the breast was removed. On microscopic examination the structure disclosed (1) ectasia of one or more of the lactiferous ducts which have irregular and sinous cavities, (2) either atrophy or hyperplasia of the epithelium, (3) formation, inside of the dilated lactiferous ducts, of fine tumors (vegetations) which are covered by cubical and cylindric epithelium and (4) proliferation, sclerosis or hyalinosis of the mammary stroma, which sometimes suffocates the acini. The walls of the lactiferous ducts are thickened and pushed away by the vegetations which have a fragile and well vascularized pedicle of connective tissue and are more abundant near the nipple and the areola than elsewhere. The author points out the importance of further study on the subject with the aim of establishing the indications or contraindications of removing the bleeding breast as a condition from which cancer may develop.

## Archiv für Kinderheilkunde, Stuttgart

**114:** 193-256 (Aug. 29) 1938

Treatment of Children with Diabetes Mellitus. K. Stolte.—p. 193.
*Etiology of "Scarlet Fever Heart": Relation Between Clinical Symptoms and Body Weight. P. von Kiss and O. Malaguzzi-Valeri.—p. 203.
*Id.: Relation Between Symptoms and Anemia. P. von Kiss and O. Malaguzzi-Valeri.—p. 207.
Congenital Defect of Ventricular Septum of Heart. M. Frank and E. Bene.—p. 214.
Surgical Treatment of Fresh and Old Epiphysial Detachments of Hip. F. Felsenreich.—p. 227.
Rare Roentgenologic Observations During Childhood. Marianne Conen.—p. 236.

**Etiology of "Scarlet Fever Heart."**—Von Kiss and Malaguzzi-Valeri define as "scarlet fever heart" a syndrome which develops in the course of scarlet fever and which is characterized by the following symptoms: by an unstable pulse; by a prolonged, soft, subdued first heart sound, which may even disappear entirely; occasionally by the appearance of embryocardia, of an accented, divided second sound at the apex of the heart; often by the appearance in the parasternal line on the left, of a soft systolic murmur and in a few cases by a coarse scraping systolic murmur at the left, immediately beside the sternum, at the level of the second and third ribs; occasionally by dilatation or arrhythmia. The intensity of these murmurs differs; during the standing posture, during the elevation of the extremities or when the abdomen is pressed in they may temporarily disappear or their intensity may greatly decrease. The authors stress that septic or rheumatoid endocarditis, pericarditis or myocarditis cannot be classified with the syndrome of "scarlet fever heart." The opinions about the cause of "scarlet fever heart" differ greatly. Some assume anatomic changes in the cardiac muscle, others consider a reduction in the cardiac tonus as the eliciting cause and still others maintain that the symptoms of "scarlet fever heart" are dependent on the fluctuations in the body weight. As the weight decreases, the symptoms increase; as the weight increases, they subside. The investigators, who demonstrated the dependence on the weight, were of the opinion that treatment is required only for dilatation and arrhythmia, not for the other symptoms, and the latter do not even require prolonged rest in bed. In view of these therapeutic conclusions, the authors decided to investigate the parallelism between the fluctuations in weight and the symptoms referred to as "scarlet fever heart." Studies on fifteen children with scarlet fever revealed no connections. Symptoms of "scarlet fever heart" were detected in all the children irrespective of whether the weight increased, remained the same or decreased. In the latter cases the greatest severity of the symptoms did not concur with the lowest weight.

**"Scarlet Fever Heart" and Anemia.**—In this paper von Kiss and Malaguzzi-Valeri report their studies on a possible connection between anemia in scarlet fever and the syndrome of "scarlet fever heart." These investigations were made on thirteen children with scarlet fever. It was found that reductions in neither the erythrocyte count nor the hemoglobin played a part in the development of "scarlet fever heart."

## Klinische Wochenschrift, Berlin

17: 1169-1208 (Aug. 20) 1938. Partial Index

Relations of Idiosyncrasy to Anatomic Structure of Epidermis. H. T. Schreus.—p. 1171.
*Treatment of Rickets with Concentrates of Vitamin $D_2$ and Vitamin $D_3$. G. Jacoby.—p. 1173.
Experimental Studies on Oral Insulin Therapy by Adding Organic Dyestuffs. F. Lasch and E. Schönbrunner.—p. 1177.
Resorption of Orally Administered Tetra-Iodophenolphthalein. W. Lutz.—p. 1180.
First Changes of White Blood Picture in Persons Exposed to Lead Poisoning. A. H. Müller.—p. 1183.
Investigations on Possibility of Transmission of Tuberculosis by Children. A. Viethen.—p. 1186.
Carcinomas in Young Persons and Children. J. Körbler.—p. 1194.

**Concentrates of Vitamins $D_2$ and $D_3$ in Rickets.**—Jacoby treated twenty-three children with vitamin $D_3$ during the winter 1936-1937 and compared the results with those which were obtained in children who were treated with vitamin $D_2$. However, the comparison of the roentgenograms and of the chemical values of the blood did not corroborate the more favorable action of vitamin $D_3$, an assertion which had been made by Hartenstein and especially by Brockmann. When a vitamin $D_3$ concentrate became available, Jacoby hoped that vitamin $D_3$ would also become obtainable in a concentrate, because he thought that in view of the more rapid and intensive curative power of the concentrates a possible difference in the efficacy of vitamins $D_2$ and $D_3$ would be detected more quickly. The author made systematic studies on the chemistry of the blood and roentgenograms in twenty-four children who were treated with vitamin $D_3$ concentrate and in twenty-two children who were treated with vitamin $D_2$ concentrate. No noticeable differences could be detected in these two groups, in either the clinical, roentgenologic or hematochemical aspects. The vitamin D concentrates had an especially favorable effect on spasmophilia. There were twelve children with manifest and seven with latent spasmophilia. With the exception of two unusual cases, the convulsions never returned. The manifest type did not develop in any of the children with latent spasmophilia and spasmophilia did not develop in any of the other children with rickets. Children with severe rickets were given twice 15 mg. of the concentrate. A dose of 15 mg. of vitamin $D_2$ concentrate did not cure craniotabes.

## Medizinische Klinik, Berlin

34: 1021-1052 (Aug. 5) 1938. Partial Index

Aspects of Painful Cardiovascular Phenomena. R. Schmidt.—p. 1021.
Clinical Aspects of Intoxications Caused by Inhalation of Gases. G. Budelmann.—p. 1029.
Family Epidemic of Psittacosis. E. Wernekhaus.—p. 1032.
*Treatment of Lochiometra with Quinine Calcium. A. Richard.—p. 1036.

**Treatment of Lochiomotra.**—Richard shows that in the treatment of lochiometra the main problem is to counteract the weakness of the uterine contractions to overcome the stasis of the lochia. Moreover, the development of a septic endometritis from the lochiometra must be prevented. The author says that both of these aims can be realized by the administration of a quinine calcium compound which in 10 cc. contains 0.6 Gm. of quinine gluconate and 1 Gm. of calcium gluconate. The ecbolic effect of the combination of quinine and calcium has been clinically demonstrated and the author recommends the intravenous administration of 10 cc. of the quinine calcium preparation in all cases of lochial stasis. If the stasis is due to spastic conditions of the internal uterine os, the author precedes the injection of quinine calcium by introducing suppositories containing the alkaloids of belladonna. The intravenous injection of the quinine calcium must be made slowly (five minutes for the 10 cc.) because rapid injection might cause collapse. If the temperature increases again, the injection can be repeated eventually by the intramuscular method. A third and fourth injection are rarely necessary. The author has resorted to this treatment with quinine calcium so far in eighty cases of lochial stasis. He gives brief histories of ten cases and concludes that, by counteracting the febrile lochial stasis, the administration of quinine calcium is a valuable aid in preventing puerperal infections.

## Münchener medizinische Wochenschrift, Munich

85: 1217-1256 (Aug. 12) 1938. Partial Index

Dietetic Treatment of Surgical Disorders. H. J. Lauber and R. R. Strack.—p. 1217.
Value of Digital Examination of Rectum in Gynecology. M. Köhler.—p. 1220.
Embolism in Diphtheritic Circulatory Disturbance. H. Zischinsky.—p. 1221.
*Trophic Changes of Skin in Chronic Pancreatitis. W. Grott.—p. 1224.
Nephritis with Fulminant Course. P. Heilmann and H. Eck.—p. 1225.
Insidious Sequels of Umbilical Infections in Nurslings. E. Calderón.—p. 1226.
Treatment of Diabetes Mellitus with Yeast. W. Beckert.—p. 1231.

**Skin in Chronic Pancreatitis.**—Grott maintains that chronic pancreatitis is comparatively frequent, but that it is not always recognized. Symptoms that make possible its diagnosis by means of the simple physical methods of examination available to the practitioner are the hyperesthesia of the pancreatic zone and the painful point at the body of the pancreas, which can be detected by the palpatory method, previously described by the author in the *Archiv für Verdauungs-Krankheiten* (58:181 [Oct.] 1935; abstr., THE JOURNAL, Dec. 21, 1935, p. 2117). In the present report the author directs attention to the presence of trophic changes of the skin in the pancreatic region; that is, in the upper left quadrant of the abdomen. To determine this trophic change the skin is laid into a fold and the thickness of the subcutaneous fat tissue is compared on the left and right sides, above and below the umbilicus, over the rectus muscle and outward from it. If the trophic change is present, the fold of skin is thinner in the region of the pancreas and the skin can be more readily lifted from its base than is the case in the other regions. Having observed this sign, the author watched for it and detected it in fifty-two patients. In twenty-one of these patients only a chronic pancreatitis existed and in thirty-one it was accompanied by diabetes mellitus; that is, the sign is characteristic for pancreatic diseases, particularly for chronic pancreatitis. Although this symptom alone does not permit the diagnosis of pancreatitis, together with other signs, it is a valuable diagnostic aid. If the trophic change is observed in patients with diabetes mellitus, it suggests a disease of the pancreas as the primary cause of the disease. A decrease or increase in the trophic change may run parallel with the pancreatic disorder; its persistence in spite of general improvement suggests that the pancreatic disturbance has not entirely subsided.

## Khirurgiya, Moscow

1-168 (No. 8) 1937. Partial Index

*Complications Due to Application of Clamps After Resection of Stomach for Peptic Ulcer. L. V. Serebrenikov and V. P. Sznezhkov.—p. 3.
Perforation of Duodenal Ulcer into Peritoneal Cavity. M. M. Levin.—p. 55.
*Alcoholization for Alleviation of Pain in Gastric Cancer and Gastric Ulcer. G. V. Perelman.—p. 61.
Causative Factors of Death in Intestinal Obstruction. I. B. Oleshkevich.—p. 80.
Obstruction of the Cecum. M. F. Camaev.—p. 88.
Appendicitis and Right Sided Perivisceritis. L. J. Pavviandzy.—p. 91.

**Complications After Resection of Stomach.**—Serebrenikov and Snezhkov consider that the main cause of early and late complications after resection of the stomach and gastroenterostomy, such as gastric hemorrhage, separation of the sutures of the stump, subdiaphragmatic abscess, subperitoneal phlegmons and marginal ulcers, appears to be the method of using clamps. The authors carried out thirty-two experiments on ten dogs. Clamps were applied on the antral part of the stomach in fifteen experiments in the first series and on the jejunum in sixteen experiments of the second series. The Doyen and Linnartz types of clamps were employed. These were applied for from twenty-five to forty-five minutes, locked

on the third indentation of the lock. Sections of tissue were taken immediately after removal of the clamps and twenty minutes after the stomach wall appeared to be recovered. A study of the macroscopic and microscopic picture of the stomach and intestinal walls was carried out after the removal of the clamps. Altogether 124 pathologic preparations were examined. The changes found were as follows: severe traumatization of all layers of the stomach and intestinal walls, especially of the mucosa, which appeared completely crushed; a considerable amount of extravasation was observed at a considerable distance from the lesion; displacement of the various layers of the wall of the stomach with relation to each other, with formation of cavities filled with blood and thrombosis and necrosis of the vessels of the stomach and intestinal walls and of the vessels of the omentum and mesentery, was observed. The authors estimated that the extent of pressure exerted by the Doyen clamps equaled 9 Kg. for each centimeter of surface of the branches and that by the Linnartz clamps was 17 Kg. On the basis of their experimental data the authors recommend, in cases of resections for cancer of the stomach in which the employment of clamps is unavoidable, the use of the Spasokukotzky type, exerting less pressure, and in cases of ulcer an operative procedure in which no clamps are employed.

**Alcoholization for Gastric Cancer and Gastric Ulcer.**—Perelman states that the method is based on the fact that alcoholization causes a break in the nervous tissue. From 15 to 20 cc. of an 80 per cent solution of alcohol was used for this purpose. In order to effect a break in the neurofibers of the sympathetic, passing through the stomach and alleviation of the pain in cases of inoperable cancer or gastric ulcer, injections should be made into the lesser omentum or, if the usual technic is to be employed, a splanchnic anesthesia is to be induced. The author reports twenty-two cases of alcoholization: in ten splanchnic anesthesia was carried out, in ten injections of alcohol were given in the lesser omentum and in two combined injections were given. The result of alcoholization was favorable, since it caused cessation of pain for from one and one-half to six and one-half months in cases of inoperable cancer. In cases of callous ulcer penetrating into the neighboring organs and in cases of pain in organs not innervated by the gastric nerve (liver), no effect is accomplished by this method. It may even cause an increase of pain, since injections of alcohol increase inflammatory adhesions.

## Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

78: 1851-1912 (Aug. 2) 1938. Partial Index

Macrocytic Blood Pictures. L. Schalm.—p. 1851.
*Immunization Against Weil's Disease with Living Avirulent Leptospira. P. H. Van Thiel.—p. 1859.
Anthropologic Studies on Inhabitants of Central Celebes: I. Blood Groups. J. W. Tesch.—p. 1875.

**Immunization Against Weil's Disease.**—Van Thiel reviews some of the earlier experiments with the preparation of a vaccine for Weil's disease and then describes his own attempts at immunization by means of living avirulent cultures of leptospira. His experiments were made with a strain that was kept in culture for eight years without passage through animals. Its behavior in guinea pigs indicated that during the last years it was avirulent or practically avirulent for the animals. The author tried the subcutaneous injection of 2 cc. of the avirulent strain of leptospira on himself and as a result passed through a very mild, atypical attack of Weil's disease. He further describes the reactions of four other persons who volunteered to be injected with the avirulent strain. All of them passed through an atypical attack of Weil's disease; in two of them it was practically symptomless, in one the symptoms were mild, but in another the symptoms were so severe that the volunteer had to stay in bed. The author shows that the stronger reaction in the latter patient was caused neither by the injection of too large a dose nor by the accidental appearance of comparatively virulent leptospira but was probably the result of the person's disposition. This case proves that the injection of avirulent strains of leptospira is not entirely without risk and danger. The author says that if none of the persons had shown more severe reactions than he himself or the one who had only mild symptoms, he might have recommended the more general application of this method of immunization. However, since the one case convinced him that the disposition of the person plays an important part and that leptospira which are avirulent for guinea pigs may cause reactions that are more severe than is permissible for immunizatory procedures, he intends to refrain from the further use of this method. Guinea pigs are apparently much less susceptible to Weil's disease than are human subjects and thus these investigations proved once more the erroneousness of the conclusion that observations on guinea pigs can be applied to human subjects.

## Nordisk Medicinsk Tidskrift, Stockholm

16: 1271-1302 (Aug. 13) 1938

"Cotton Dust Disease," Occupational Disease Among Operatives Exposed to Cotton Dust. E. Trier.—p. 1271.
Idiosyncrasy to Quinine in Treatment of Varices. O. Arnell.—p. 1277.
Congenital Stenosis of Nasal Duct, Its Complications and Treatment. K. O. Granström.—p. 1280.
Easily Borne and Economical Method for Administration of Oxygen. B. Scherstén.—p. 1283.
*Death Due to Histamine: Case. P. Maijala.—p. 1287.
New Fixation Ocular for Determination of Field of Vision in Unilateral Central Scotoma. Å. Lundberg.—p. 1289.

**Death from Histamine.**—Maijala's patient, a man aged 32, with a history of gonorrhea, had had attacks of pain in the stomach region and slight dyspnea on exertion for a half year. The heart tones were clear except for a weak systolic murmur over the apex and the second intercostal space on the left edge of the sternum; the second aortic sound was slightly accentuated. Syphilitic aortitis was suspected. To investigate the nature of the patient's achylia a histamine test breakfast was given (0.8 mg. of histamine subcutaneously). Death occurred half an hour later. Necropsy showed syphilitic aortitis, the orifices of the coronary artery being almost completely obstructed by scar tissue. The aorta was not dilated. The histamine is believed to have caused circulatory disturbances, and the cause of death was acute cardiac insufficiency. The author cautions against the use of histamine in patients with aortic or suspected aortic disturbances.

## Ugeskrift for Læger, Copenhagen

100: 871-896 (Aug. 4) 1938

*Failure of Tetanus Prophylaxis. J. Hertz.—p. 871.
Acute Porphyria: Two Cases in Siblings. R. Hammen.—p. 878.
Double Vagina and Double Uterus with Delivery: Three Cases. P. Freudenthal.—p. 883.
Linitis Plastica with Stenosing Intestinal Metastases. H. Gormsen.—p. 886.

**Failure of Tetanus Prophylaxis.**—Hertz reports three cases in which prophylactic injection of tetanus antitoxin was given and in which a well defined tetanus developed, with fatal outcome in two, in spite of energetic treatment. He says that the part played by the mixed infection which must have been present is uncertain. In one case there was extensive gangrene, and primary excision of the wound edges, done in the other cases, had not been performed. From the literature and his personal observations he concludes that, in lesions subject to infection with tetanus, prophylactic injection intramuscularly is called for as soon as possible, preferably immediately after the lesion, together with careful wound treatment with primary excision of the wound edges and removal of necrotic tissue. In case of constant suppuration in the suspected wounds the antitoxin injection should be repeated at suitable intervals of from about eight to ten days. Since every mechanically acting secondary trauma involves the danger of the occurrence of manifest tetanus, the antitoxin injection should be repeated before a surgical reintervention. The secondarily injected antitoxin is eliminated even more rapidly than that of the first injection and thus affords protection for a shorter time. If, in spite of the prophylactic measures, tetanus appears, amputation must not be delayed too long, as it eliminates the focus from which the bacilli send out their toxins. The only danger connected with the injection is that of anaphylactic shock, and anaphylactic reactions from prophylactic injections of tetanus antitoxin are exceedingly rare.